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*Computers in
Management
(subtopic - Education)
S & T Belov*

DRAFT

NOTES FROM TOPIC 5 DELEGATION TO USSR

9/18/75 - 9/30/75

D.D. Aufenbump

*computer and education
+ dec-making & education
high level exec.*

MINISTRY OF HIGHER AND SPECIALIZED SECONDARY EDUCATION (MHE)

Soviet Participants

N. S. Yegorov, Deputy Director

N. ^N. Ivashchenko, Deputy Chief, Main Department of Higher Education

Institutions

A. K. Kalinin, Chief, Main Department of Scientific Research, MHE
of the RFSSR

V. V. Semin, Deputy Chief, Department of Personnel

A. M. Tsiganenko, Deputy Chief, Department of Instruction and
Methodology

A. N. Leontyev, Dean, Psychology Faculty

The ministry is responsible for control of training of all specialists in education including those in management. There are several types of institutions - universities, engineering institutes, medical, agricultural, etc. Questions of management are taken into account in all. Some universities are doing management training.

Both the Ministry of Higher and Specialized Secondary Education and GOSPLAN are looking at long range education policy in cooperation with other ministries. The State Committee for Science and Technology has a special institute for high level executives, the Institute of Management of the National Economy. Also the MHE has one institute concerned exclusively with training experts who will work in different branches of industry, the Ozdjonikidze Institute of Management in Moscow (formerly

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11 November 1975

the Institute of Engineering and Economics and, as we were told in March, renamed the Institute of Control and Management).

MOSCOW STATE UNIVERSITY

Soviet Participants

F. M. Volkov, Pro-rector

M. M. Maslov, Pro-rector

A. S. Pankratov, Deputy Pro-rector

M. V. Solodkov, Dean, Economics Faculty

A. N. Tikhonov, Dean, Cybernetics and Applied Mathematics Faculty

The university provides training in nearly all fields (medicine is lacking, for instance). There are 20,000 full-time day students, 5000 part-time students and 2000 correspondence students. A total of 4500 assistants are being trained. There were last year 3200 specialists from other institutes in training and 3600 from industry. Full-time students have a 5-year course of studies; correspondence students have a six-year course. Eighty percent of the students were said to be guaranteed a stipend.

There are 3500 teachers and professors on the staff. Of these, 119 are academicians, 950 are professors and doctors of science. All staff take part in research as well as most students. There are several specialized institutes and many laboratories. Each year 500 books and 8000 articles are published by the staff.

In reference to the Economics School, there are two principal areas of concentration. One area includes political economy, history, history of economics tasks and a wide range of topics in classical political economy.

It provides a good base for specialization. The second area includes special courses on state budgets, industry, standard of living, traditional methods of planning and applications of certain models. Traditional methods were said to be still in use in spite of all the theoretical work. Models have, for example, been useful in some cases, e.g., transportation, but have not been helpful in social problems. There is no attempt to train engineers in the economics school.

The Ministry of Higher Education has no contracts with industrial enterprises.

It was also stated that there was some feeling that the Institute of the Management of the National Economy (Director, V.G. Shorin) should be under Moscow State University.

There is a system of economic contacts--a contract with ZIL (the automobile factory) was mentioned. Currently, there are about 1000 contracts with enterprises amounting to 23,000,000 rubles.

Academician Tikhonov emphasized that the general control of management was not the goal of the university. Specialists are trained in technological management. On-the-job training is arranged on the basis of 3-year programs. The programs are different for people from industry with special interests and for students without such a background. They have tried to stress individual training for the people from industry. About 30% is on fundamentals but with emphasis on recent developments, 30% is on special courses to increase breadth of view and 30% is for very special topics. The work is carried out with small groups of 6 to 8 engineers each.

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There is some research on economic control carried out in the School of Cybernetics and Applied Science. One job completed recently was for the consumer goods and textile industry. The contracts in economics with industry often involve large calculations (a second BESM 6) is being installed in the computer center. Tikhonov mentioned that he has an article in the Soviet Encyclopedia on mathematical models. He is also involved with industrial contracts on oil drilling research in which it was mentioned that the scientific foundation and electronic technology are very much dependent on each other.

There was a reference to special on-the-job training seminars for high-level executives, for example, the heads of Chairs. This year the heads of Chairs of numerical mathematics were involved.

A discussion of possible forms of cooperation included seminars, and exchanges of information. The experience with the Ford Foundation--sponsored seminars with New York University was mentioned. One possible subject for exploration might be a study of how scientific/technological systems are realized in both countries.

MOSCOW STATE UNIVERSITY (ECONOMICS DEPT)

Soviet Participants

M. V. Solodkov, Dean
U. N. Speranskaya, Deputy Dean
I. P. Faminsky, Deputy Dean

E. Z. Maiminas, Professor

V. N. Bronnikov, Associate Professor

G. N. Zoteev, Associate Professor

V. M. Yefimov, Senior Lecturer

V. J. Marshev, Senior Research Fellow

A. N. Sobronin, Postgraduate

A. V. Fadeyev, Postgraduate

The Economics Faculty has been assigned responsibility for developing and implementing the technical program of Topic 5. The Faculty of Economics was established in 1941 with three main sections: political economy, management and cybernetics. There are 2000 students and 300 are working on Candidate degrees. The Faculty is organized into 13 departments, most of which have scientific laboratories. For example, the department of political economy has a laboratory on important issues of modern capitalism and one on studies of complex economic issues and conditions of developing socialism. The management department has a special section for management in industry, a laboratory for theoretical work and a laboratory on branch and territorial work.

In regard to the organization of the Economics Faculty, the Dean has four deputies including one for science, one for international affairs and one for economics. There is an Administrative Council associated with the Dean's office which includes student representation. It is concerned with global development of the Faculty.

We visited also the Center for Management Problems within the Economics Faculty. It is under the overall direction of Popov and cooperates with many foreign institutions. There are four parts: a laboratory for theory of management problems (Marshev is associated with this laboratory, a section on industrial management concerned with branches of industry and regional

management, a Chair for education under Bronnikov, and a laboratory for active (i.e. case) studies for training and management games including interactive approaches. Gvishiani wrote a book on management while at the Center in its early days. The staff has gone from 8 to 80 since Gvishiani's time. The student body includes staff specialists for managers at all levels up to ministers in addition to the usual university students. The students go to different enterprises for practice before receiving diplomas. Some go to ITASA. The university students are in the age range of 19-23.

Soviet proposals for cooperation under Topic 5 were presented and included systems of management training, planning and forecasting of of managerial resources requirements, methods of training, computer applications to management training and simulation games as tools for high-level management training.

OZDJONIKIDZE INSTITUTE OF MANAGEMENT, MOSCOW

Soviet Participants

M. A. Bishaev, Pro-rector

V. S. Rumyantsev, Dean, School of Computer Services

G. A. Bryansky, Dean

V. J. Mamontov, Chief of Chair of Computers

I. V. Kuzⁿvetsov, Doctor of Economic Sciences

I. A. Ivanov, Associate Professor

Dydorian, Head, Chair of Information Management Systems

The director of this institute is Ms. Koslova. This institute was formerly called the Institute of Engineering and Economics. At the time of the visit of the U.S. delegation on educational technology in late March (under Aufenkamp), Bogomolov (MHE) told us the name of the institute had been changed that very week to the Institute of Control and Management. (Director Koslova was not present in March either. Mamontov who had been on the Soviet delegation to the U.S. on Topic 5 in December 1974) was present both times.) The visit in March had been to the old building in Moscow. This visit was to the new campus being constructed on the outside of Moscow.

The Pro-rector, Bishaev, said that the institute is primarily a teaching institute but scientific research is also important. There are two general thrusts at the institute:

- 1.) models for the scientific basis of management
- 2.) methods of preparing case methods

Special attention is given to information systems and modeling.

Kuznetsov described some of the philosophy of the institution in regard to its program in economics. He stressed the need for theoretical work in the field of systems of management. The different aspects of management include the organization and technical side as well as the socio-economic side. They have the opportunity to cooperate with many countries and can use some of the achievements of foreign countries. He indicated that the Soviet system of national economy has some aspects which cannot be handled well in foreign countries.

Kuznetsov indicated, too, that they were interested in American experiences in top management especially at levels of major departments.

He is also interested in behavioral theory relating to interactions among people as it affects the organizational/technical side of management. He stressed that the work on the technical side of management parallels work in some other countries but that the work on the socio-economic side has some differences.

Ivanov discussed general questions of training managers. They try to train managers to solve problems which can be "formalized." By "formalized" he said he meant problems which could be solved by computer--the relationship between "formalized" and "unformalized" problems being most interesting(!)

Bryansky mentioned ^{that} in working out the general principals of preparation of specialists they take into consideration the characteristics of the country. Some possible topics for cooperation that he mentioned included (1) modeling and decision problems on a national basis as well as on the regional and branch level, and (2) forms and methods of teaching (he is preparing a text this year to be published next year). He mentioned, too, that students prepared case studies.

Mamontov described the curriculum as it related to computers. Students enter at age 17 and begin to study computing from the first year. They start with simple computers and from the 2nd and 3rd year work with the ES series. Some work is of a general nature but students get practice in special computer centers for about six weeks on problem solving. Term projects are also assigned and we were shown examples of reports on the projects.

Professor Rumyantsev who is Dean of the Faculty of Computer Sciences indicated that computers are not used extensively at the upper division level--only a few hours of practice. They expect to introduce time-sharing

computers with the completion of facilities in a new building. They now use the NAIRY II and the ES 1020 systems. Languages taught are PL1, FORTRAN, RPG and assembly.

Dydorian, Head of the Chair of Information Management Systems discussed four aspects to management information systems (MIS)--organization, information, technical and mathematical. One software package called SINTEZ is in operation at the institute. It was said to be similar to a package called ORGANIZER. Another model (software package) is used for production schedules and several other models are used in different types of economic calculations.

He described a course in automated management systems which was in two parts--(1) principles of elaboration of MIS and (2) modeling MIS. The mathematics side of MIS also had two parts: (1) creation of mathematical models of economic calculations and (2) creation of mathematical programs. Mamontov is responsible for mathematics teaching and Dydorian for instruction on modeling.

The data bank problem is considered from several viewpoints which have both theoretical and practical aspects. There is a special course on the treatment of economic data based on Glushkov's work.

With the new programs in the institute (which lead to the change in the name) there is a much wider range of training of specialists. Along with this new thrust there is a need for creating many new manuals and text books.

The computer center facilities were also visited which featured the ES 1020. (A sample of the console printout from the ES 1020 is available).

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PLEKHANOV INSTITUTE OF NATIONAL ECONOMY, MOSCOW

Soviet Participants

I. G. Popov, Pro-rector (also Chairman of Economics Dept.)

B. I. Iskyakov, Chairman of Department

V. V. Ozira, Chairman of Department (Alumnus of Harvard Business School)

A. V. Korchagin, Chairman of Department

G. A. Yeremeyev, Chairman of Department

Bolubov, Professor in Ozira's Department

A. K. Kalinin, Chief, Main Dept. of Scientific Research, MHE of RFSSR

The pro-rector described the institute and its programs. The institute is 68 years old. There are 14,000 students--5,000 day students, 5,000 evening students and 4,000 correspondence students. There are also special classes involving 2,000 students. The day students enter at ages 18-19. There are 5 applicants for each place at the institute.

About half the students are in the area of trade including topics as pricing, economic labor, cybernetics, industrial planning, purchasing and supply, finance, economic commerce and accounting. There is a placement plan for entering students--apparently a combination of MHE and GOSPLAN suggestions. Possibilities are made known to the students and the applicants work out a program with the dean. There is competition on merit.

Representatives (recruiters) of employing organizations come to the institute to seek out good graduates.

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Ozira described the postgraduate management program. This was started in 1965 along with some economic reforms. The special 1965 order created 5 new postgraduate programs, the others located at the Moscow Institute of Management (Koslova, director), Urals Polytechnical Institute at Sverdlovsk, Leningrad Industrial Engineering Institute (Segov, rector) and Kharkov Industrial Engineering Institute. The emphasis is on industrial management. At Moscow there is an industrial planning department and people are responsible for topics as planning and finance. For instance, the State Committee for Purchasing and Supply sends its executives to the institute for special training. At three of the other locations there is an emphasis on middle level production management.

There are 11 departments in this special postgraduate management program and two courses of study in each department. One course of study is six months in duration involving people in their late 20's to late 30's. The other course of study is three months in length on advanced management problems for heads of enterprises or deputies or those in similar positions in republic planning departments. Students are mainly engineers. There is an attempt to combine management and economics in the instruction under the following three topics

- 1.) origins of industrial planning
- 2.) supply and purchasing
- 3.) planning of national economy

there are 200 graduates each year.

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New departments of organization (Industrial Management) are being established at Gorki, Alma Ata, Tashkent, Baku (specializing in oil) and Minsk (probably at the institutes of the national economy in these cities).

There is a total of 600 academic hours over six months including a thesis on practical applications. The organization supports the costs of its students and the students return to their regular jobs at the end of the program. Students keep their salaries and receive expenses and a field trip. An overview of the six-month program includes

- 20 hours - economics
- 20 hours - planning
- 30 hours - accounting
- 20 hours - economic statistics
- 50 hours - use of mathematics
- 50 hours - forecasting markets
- 50 hours - importance of management
- 100 hours - economic planning (from supply viewpoint only)
- 20 hours - problems of finance, money, banking
- 20 hours - operations and maintenance
- 20 hours - business law

Under topics in management, Ozira includes concepts, strategy, implementation, structure of management, problems of improvements. Ozira has designed a special course on decision-making including three cases which he uses. Ozira has seven faculty members in his department.

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Iskyakov is chairman of the computer department. The facilities are based on the Minsk 32. They will have one of the ES series in a new building. FORTRAN and COBOL are used.

The chairman of statistics (possibly Korchagin) described the statistics program. The department is large, containing about 40 members. They are exploring ways of introducing more use of computers in teaching statistics and also ways of improving the curriculum generally. Some of the topics include theory of production functions, statistics of forecasting, model building in statistics and theory of taxonomy. The Ministry of Higher Education encourages these improvements in the curriculum and hopes to introduce new ideas for teaching statistics using computers and the use of computers in research. In one effort on building welfare functions with the help of computers they tried to consider the dynamics of the system including factors as the index of industrial goods, consumption of services, consumption of information, and an integrated index of living standards. Some preliminary results were presented at a meeting in Warsaw.

A reference was made to Goldenberg at the Federal Bureau of Statistics.

Golubov, a professor in Ozira's department described a course in systems analysis and decision-making in management which included topics on decision trees and heuristics. His own speciality was models dealing with branch economy.

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Yeremeyev made several general observations. In the current five-year plan, there is an emphasis on creating national computer systems. A problem arises when the quality of information is poor. Also too much information can be a problem as he said arose in trying to develop a system for the Ministry of Fisheries. The question is what kind of information does a manager need.

Several possible topics for cooperation were mentioned by the Soviet participants in the course of the discussions. Among these were

- 1.) integrated indices of living standards
- 2.) dynamic models of national economy, long-range economic forecasting (2 centuries)
- 3.) macroeconomics - production functions
- 4.) coupling teaching methods in modeling development with research in the same area
- 5.) bringing together information on decision-making theory
- 6.) research on improvement of electronic data processing systems from the viewpoint of decision-making

Kalinin suggested that perhaps one form of cooperation might include, for example, 20 people in each country working together in a project area with two people from each country going abroad for long-term stays. At appropriate times, conferences on the efforts could be held in both countries.

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LENINGRAD INSTITUTE OF FINANCE AND ECONOMICS

Soviet Participants

U. A. Lavrikov - Rector

L. S. Tarasevich - Pro-rector

Yermolin - Dean of Faculty

I. M. Syroyezhin - Chairman, Department of Economic Cybernetics

I. V. Romanovsky - Professor

S. R. Gidrovich, Senior Lecturer (Syroyezhin's lab)

U. U. Kurolepin, Senior Research Fellow (Syroyezhin's Lab)

Minovsky, Faculty of Mathematics, Leningrad University

We were met at the airport by Syroyezhin on the Sunday preceding our visit to the institute. Syroyezhin has spent a year at Cornell. Also two members of the U.S. delegation to the U.S.S.R. in March 1975 on educational technology met with Syroyezhin.

The rector, Lavrikov, gave a profile of the institute. There are six faculties with full-time students. Yermolin is dean of the postgraduate faculty and training of executives as postgraduates. There are evening courses as well and branches of the institute in Murmansk, Novogorod and Vologda. There is a special Faculty for foreign students. Students at the present represent 27 countries. One person will be coming from the U.S. There was one man from the U.S. two years ago and one in social economics from England. In all there are 320 foreign students mainly from Africa, Europe, Asia (India and Vietnam)

The student body totals 10,000 students. The course of study is 5 1/2 years with 2 1/2 years of general training including social science, mathematics and applied science, technology and 2 1/2 years of specialized training in 8 trades (there is both micro and macro economics). About 60% of the graduates stay in the Leningrad area and the rest go elsewhere.

The staff numbers 720 (teaching professors). About 2,000,000 rubles per year are received for research. The scientific research deals mainly with automated management systems in industry, cost-benefit analyses, and regional balances. (Liontief was said to have been interested in the first input/output analyses on northern regions done at the institute--I believe in 1923).

The institute is both a teaching and research institute. (Some by industrial branches have specialized institutes) The operating budget is about 20,000,000 rubles per year. There is roughly a 70-30 split between teaching and research. Salaries can be augmented up to 50% through contract research.

Class size varies. Syroyezhin deals with group methods--the class size ranging from a few students to more than a hundred. For example, there are 7 students in a class in his simulation laboratory.

There has been some exploration of the use of programmed instruction with some success in languages and geography. Some programs have been acquired from the Institute of National Economy in Kiev. Two systems for languages have been acquired from Czechoslovakia.

Lavrikov gave his views on the characteristics of a good manager in response to a question. He emphasized

- 1.) competence
- 2.) scope of knowledge--ability to do macroanalysis plus a strong vertical insight
- 3.) dynamic nature (business-like approach)

There was interest in the cost-benefit analysis effects of decision-making. And also much interest in U.S. methods at business schools. Reference was made to a special conference three years ago on U.S. and Soviet teaching methods. The pros and cons of short courses (1 week) versus 3 months or longer were discussed. A special school (or section) has been proposed for planners and organizers with a duration of one year. Training and retraining of managers is not, however, a principal responsibility of the institute although the trend is one of broadening participation.

Lavrikov mentioned some of the proposed subtopics which would be of interest to him. Among these were

- 1.) methods of training
- 2.) simulation techniques as a training device
- 3.) computer use in training and retraining managers (with 2nd and 3rd generation computers)

Also it was suggested that the Leningrad Polytechnical Institute (which was visited by the educational technology delegation in March 1975) might have some interest through its industrial engineering programs.

Professor Minovsky of the Mathematics Faculty at Leningrad University and of the Economics Faculty as well suggested the possibility of the joint preparation of a special review of management training which would be published widely with special teams of U.S. and Soviet experts working on follow up activities.

Visits were made to several laboratories of the computer facilities. Presently, the institute has four medium-size computers of the Minsk class. They hope to get an ES 1030 later. There are many small machines--about 250 in all--of the MIR and NAIRY class. All students study FORTRAN, COBOL and ALGOL. A few classrooms and laboratories were visited also which made use of audiovisual teaching aids. Classes were in session and there were many students around in corridors and laboratories.

Syroezhin arranged more detailed discussions on his interests that took place in one of his laboratories together with two of his assistants, Gidrovich and Kurolepin. Syroezhin emphasized the following point in regard to business games (Later--following a suggestion of John Lubin the term collective decision games was used. The Soviet terminology is simulation-gaming models.)

- 1.) formulation and development of special theory of business--
it must be realistic
- 2.) games have to be used
- 3.) in business games--the approach is one of trying to remove the teacher at the point the outcome is clear without intervention of teacher.
- 4.) the real usefulness of games for managers and students is to make sets of priorities understandable to managers and to make the available options known in terms of the benefits within the framework of priorities.

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In regard to the use of computers there were said to be two almost conflicting views. On the one hand computers could lead to an increase in decision-making but on the other hand the same technology could be used to decrease decision-making. On the Soviet side, Syroyezhin is trying to design games to increase decision-making with the real result being the development of collective decision-making in that none of the participants has the right to claim his decision is dealing with the system as a whole system..

Games are useful in the context of "ill structured" problems as are many of the complicated business problems. The most difficult problem is to comprehend diversity--there is almost a continuum of decision-making.

A series of games has been developed in the laboratory.

1.) IMPULSE. This is the most complex of the games and involves managing the whole economy. Three branches and nine enterprises are involved. The factors considered are

- raw materials
- industrial tools
- consumer goods

There are 1 to 3 products for each enterprise and the model includes problems of changing personnel. External resources include technical inventions, forms of production and raw materials. In this game the decisions are made only in an individual branch in that there are no interbranch connections. The government is a player as any other player but has the right to change the rules of the game within prescribed limits on the number and

extent of changes during the course of the game.

All participants understand the priorities. About 80 decisions have to be made in the course of the game. Each economic unit consists of 3 people with 60 people in all. There are weekly meetings of all participants to receive new inputs, etc. In the 4 or 5 hours following each meeting the next "2 years" are analyzed and this is followed by homework.

(In response to a question Syroyezhin said no studies had yet been made of intergroup interactions).

- 2.) EPOS. This game is representative of the second set of games created by Svetlana Gidrovich. EPOS I and II have been completed with EPOS III in the design stage. The game models the administrative structure of a generalized business with an overall coordinator and administrators of resources. The starting point is an elaboration of the initial plan by the coordinator. The real point of the game was described as one in which the coordinator must sell the plan to the subordinates--an example was given of an enterprise asking for help in introducing a new product and the use of the game was suggested to explore alternatives. Both technical developments and social factors are included. The social factors include for instance factors as housing, vacations, day care centers.

The game received a medal at the Economic Exhibition in Moscow.

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3.) ASTRA (Administrative and Structural Analysis). This set of games is not used with students at the institute. ASTRA is international in scope and requires participants from the same technological background. There are three main parts

1. judges
2. group simulating the problem
3. group simulating the management structure

Some versions involve movement of resources. ASTRA 1, 2 and 3 have same design base but have different scoring mechanisms. ASTRA 4 has new features which are particularly useful in structural analysis of business. The generation of situations is difficult.

For the future the plans for each set of games are:

- 1.) IMPULSE - expand on diversity and automate (this will take five years)
- 2.) EPOS - few proposed changes
- 3.) ASTRA - changes to account for more subtle organizational structures

Syroyezhin felt that ASTRA would lend itself as a basis for cooperative projects involving comparisons of results of decision-making under Soviet and American management approaches. The games could be used as a path to a better understanding of the systems.

Kalinin, Chief of the Main Department of Scientific Research of the Ministry of Higher and Specialized Secondary Education of the Russian Federated Soviet Socialist Republic, indicated that his department of

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research and development could be used as a test bed for introducing innovations brought about by the use of the game. (He also mentioned an R&D in science budget of 500,000,000 rubles).

TALLINN POLYTECHNICAL INSTITUTE

Soviet Participants

N. Tiismus - Pro-rector

R. Uksvarav - Professor of Organization and Management

M. Habakuk - Associate Professor of Organization and Management

O. R. Lillenu - Chief of Department

W. Kracht - Management Information Systems

The pro-rector, Tiismus, gave an overview. This institute is relatively new--being established in 1936. The idea originated, however, about 1917 for a regional polytechnical institute. In 1920 there was a technical school in Tallinn but it became an institution of higher education only in 1936.

There are 5,000 full-time students, 4,000 part-time and correspondence students. (They expect 11,000 students by 1980). There are 6 full-time Faculties--economics, energetics, mechanics, construction, chemical automation and electrical automation. Also there are evening and correspondence Faculties. In all there are 48 departments and 627 instructors and professors. Of these 62% have either the degree of Candidate in Science or Doctor of Science.

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Teaching is carried out in two languages. Two-thirds of the students take courses in Estonian, one-third in Russian. Twenty-seven different nationalities of the U.S.S.R. are represented at the institute. Attendance is compulsory. Exams are given after each term. Half of the students live in dormitories and 81% have stipends.

Almost all of the faculty engage in research either through contracts with industry or through state support. The contract research amounts to 2,500,000 rubles per year. The main fields of research are

- environment (there is cooperation with Scandinavian scientists on the bay.)
- oil shale applications
- management problems and automatic control
- research in chemistry on glues for use in construction materials
- mineral fertilizer applications

There are many links with industry. Included are

- the practical experience via students, (For much of the time the students are at the institute)
- students who graduate assist the institute in some cases and propose new ideas
- qualification commission in which leading experts take part
- contracts with industry

Examples of work with industry included:

- thermo energy--construction of boilers for oil shale power stations
- assistance with the uniquely constructed outdoor stage ~~that holds 30,000 --~~ capable of holding 30-40,000 performers (with an audience of 250,000 people).
- a contract with Estonian radio (150,000 rubles--apparently most contracts are much smaller) for survey sampling and analysis.

The order of priorities at the institute is

- 1.) training students
- 2.) research
- 3.) contracts with enterprises

It was noted that there is a trend now for students to choose humanities over majors in technology, the order being economics, construction, automation, etc.

There are special qualification courses (extension courses) given at special institutes in Moscow, Leningrad, and Kiev for top management.

Uksvarav described the department of Industrial Management and Planning of which he is head. He was in the U.S. at the University of Chicago in mathematical biology and then at other places for about nine months. He is professor of organization and management with special interests in data analysis.

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There are 150 day students in the department, 300 evening students and 300 correspondence students. He is trying to stress what would be needed for managers at the end of the century. There is a special experimental thrust in which students do an applied research thesis in cooperation with industry. The contract research involved problems of organization, relationships, staffing, education and decision-making. He mentioned one area of possible cooperation as a critical analysis of dynamic information systems for top management.

There were other comments. Tiismus stressed the need to educate managers so that mathematical models would be useful to them. Also it was mentioned that "fuzzy" systems are being studied with up to 1,000 situations and 500-1,000 variants. They are designing compiler writing systems to work in problem-oriented languages. Another suggested project area concerned found methods to analyze manager's profiles.

We visited the journal library and the computer facilities. Twenty periodicals are published there. The library itself was new, well designed, used by students and had a very impressive number of journals on display from many countries including U.S. There appeared to be on the order of 600 journals on display. The computer center was also well organized and included Minsk 22 and 32 computers and ES 1020 and 1030 computers.

Students were in abundance--both in classrooms, corridors and the cafeteria (a full lunch cost 60 Kopecks). We also saw a new conference facility equipped for simultaneous translations.

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ALL-UNION COUNCIL OF SCIENCE AND ENGINEERING SOCIETIES, TALLINN

The meeting was chaired by Professor Uksvarav of Tallinn Polytechnical Institute. There were representatives from many groups. Included were

Institute of Soil Science (representative of management)

Ministry of Labor (staff utilization - formerly in management training in Ministry of Light Industry)

Science Research Laboratory of Estonian Planning Committee
(automation of planning - information preparation and software)

Estonian Institute of Information, Estonian GOSPLAN, (personnel management and social development)

Institute of Information (management of scientific information)

Ministry of Timber Industry (head of management dept.)

Tallinn Polytechnical Institute (Department of Planning - Management of Information)

Estonian State Committee for Science and Technology

A management committee for the Council prepares a program for a six month period. One part consists of talks by individuals and general discussions on topics of interest. Examples included

- a talk on his experiences by a member who took a special course on consulting
- discussion of certain problems of publications which resulted in recommendations to the publishing house.
- a seminar on the role of the supervisor in enterprises. A paper was presented and there was discussion. (There were several repetitions of the seminar due to interest.)

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The second part deals with problems of disseminating management know-how around the republic. All managers in the area would meet to exchange views. It was mentioned that they met with a U.S. company in the spring.

A general discussion followed in which questions of general interest were asked by both U.S. and Soviet participants.

MANAGEMENT TRAINING INSTITUTE, MINISTRY
OF CONSUMER GOODS, TALLINN

We met with the Director of the Center of Management and Scientific Organization of Labor, Jacob O. Portnoi, and the Head of the Training Department, H. I. Cala. Also present was the deputy director to Portnoi and two assistants, Talia Marja and Carlson. (Talia Marja's academic work was in social psychology at the University of Tartu. She had been with the institute only a few months.)

H. I. Cala described some of the work of the Center. She said that when the Center was created in 1961, it was called the Methods Center of Training. They had only short term courses initially. There are six departments (possibly only 35 instructors). Departments include the following functions:

- 1) high level managers
- 2) refresher training for industrial specialists (formerly for high level managers)
- 3) refresher courses for mid-level managers
- 4) refresher courses for on-site workers
- 5) publications (programs on methods of training)
- 6) laboratory for active forms (case method) of training

(puts into practice new forms of training)

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There are 13 cabinets or programs for different industries with light industry. Courses are both full and part time. Lecturers are drawn from ministries, Estonian Academy of Science, from industry and other places (but not from the Center itself). About 4500 workers are trained per year. The training of professional managers started in 1971 with 10 month courses. About 10-15 per cent are top managers. There are 70 topics on themes in the courses for the range from director to secretary. Although the institute is under the Ministry of Consumer Goods, it assists all of Estonia.

Portnoi described more of the work of the center, its role in Estonia and especially recent program developments. There are many branches to the Ministry of Consumer Goods (light industry) including textiles (cotton, wool, etc.), leather, shoes, accessories, etc. About 37,000 people are involved in Estonia (750,000,000 (?) pieces (?) in 1975).

A new center was created in 1975 which operates under the contract system. There are 6 instructional divisions with 96 experts and specialists. Of the 96, 70 are workers from industry, the remainder have administrative jobs. They have a laboratory system of management and give special attention to improving qualifications. Each laboratory has 10-15 people. There is, for example, a laboratory of staff studies for training managers for light industry. There is a textile department, also information service bureaus concerned with matters as norms of production. Labor conditions are studied from both the psychological and physiological viewpoints.

Included, too, are advanced methods of labor among workers. There are competitions among workers. Films are shown of the best methods and they try to introduce and promote the best methods.

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Since 1971, ^{they} have started to train high level managers for light industry and have trained four different groups thus far:

- 1) reserve of directors (people to be promoted) - 11 people
- 2) reserve for deputy directors - 10 people
- 3) chief engineers - 23 people
- 4) shop manager - 23 people

They have people, too, from Latvia and Russia. As of January 1975, the statistics indicate that 54 percent received higher positions after graduating from this course.

Portnoi gave a detailed breakdown of the training given managers during the 10-month training program:

1. Selection procedures - higher education, 10 years of experience, personal capabilities to be managers. (They had no tests. Applicants were proposed by enterprises and selected by a commission. A few applicants refused.)

2. Theoretical training - 5 months

- 240 hours of training of fundamentals of management in industry
- 140 hours of economics and organization of labor in light industry
- 70 hours of labor and personality in socialist society

3. Training in Enterprises - 5 months (in field of training)

Several topics (?) are emphasized including organization of labor; management systems on level of shop, factory and higher levels; organization of management in functional spheres; and organization of system of management of enterprises generally.

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4. Procedural Aspects

Each trainee is given a consultant (advisor). There is a strong emphasis on diploma projects which have both theoretical and practical aspects. The projects are often revised from both aspects in consultation with advisors including people from the enterprise. Finally the diploma project is defended before a commission consisting of the Deputy Minister and other experts from enterprises and academic institutes. Grades are from 1 to 5.

Portnoi noted a few of the problems encountered including differences in backgrounds of students which resulted in differences in progress. Also some institutes did not take the school seriously and did not send the best students.

5. Examinations and Evaluations

Examinations are given in the theoretical aspects. The grade on diploma projects on the theoretical part are also taken into account in reference to the high level managers. For those applicants in the top two grades where the candidate degree is a prerequisite, no diploma is given (the reference is not clear for the top two grades--possibly the director reserve and the deputy director reserve). The third category (possibly the reference to chief engineers) is assumed to include people who could make significant changes in a plant).

The training was very helpful to many--particularly since most applicants were good in technology but had little training in management. The experience was judged very good by the U.S.S.R. Some 55%-60% of diploma projects resulted in economic improvements. One special difficulty with the 10-month training program was that not everyone could come, so other programs were devised.

Portnoi then described another program of training which covers a period of 1 1/2 years but will not take people from their jobs for long periods of time. The first course will begin in October 1975. There will be no formal selection process--groups will be simply formed by the enterprises--although there will be a few prerequisites. The groups will receive 350 hours of theoretical training. The program is diverse because of wide educational differences. Topics include theory of management, psychology of management, scientific origins of labor, selected topics in pedagogy pertaining to adults, and fundamentals of labor laws.

Their first two weeks of the program will be held at the institute. During the next six months, two days a month will be at the institute. This period will be followed by another two weeks in residence at the institute and another period of six months of two days per month at the institute. A paper is to be prepared by each student which pertains to the student's job. Each student will have an advisor and diploma papers will be revised from both the theoretical and practical viewpoints before implementation (a strong point is made of implementation of projects.) Students will receive an exam and a certificate (not a diploma).

About 90% of the trainees have higher or specialized secondary education. There were six candidates of science and several candidates in medical sciences. Some were postgraduates. We learned, too, that about 90% of the trainees at the institute were women.

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We visited several classrooms and met one group of about 20 trainees coming to class (I believe all were women--most appearing to be in their 30's). Several of the classrooms were set up with semiautomated instructional aides permitting monitoring by the instructor of subgroup responses.

TALLINN EXCAVATOR FACTORY

The factory is under the Ministry of Road Machines. We met with T. Andel, the Director. He was a graduate of Tallinn Polytechnical Institute in 1955. He came to the factory in 1961 after being head of a small enterprise in Tallinn in 1957. Tallinn Polytechnical Institute was said to be the main source of specialists for the factory. He has visited 16 plants in the United States. He was probably 43-45 years old.

The factory produces excavators based on the design of the Belorussian tractor for continuous action drainage excavating. This is the only factory in the U.S.S.R. producing this product. The plant produces products for all the socialist countries and also exports products to 30 other countries. Service stations are maintained in Czechoslovakia, Iraq, Poland and the German Democratic Republic. There are also specialists in other countries.

About 1700 workers produce 2000 machines per year plus spare parts. The main plant is in Tallinn and branch plants for producing special components are located at distances of 90 to 200 kilometers. About 400 technicians and engineers are at the branch plants. The shop foremen have higher education and about 140 engineers and other specialists are graduates of Tallinn Polytechnical Institute.

There is a strong emphasis on the problem of increasing the effectiveness of workers. In these efforts there are strong links with other institutes, for example, Tbilisi Polytechnical Institute and the Moscow Institute of Road Transport. The factory serves as a "laboratory" for institutes in that young students work as apprentices under the direction of old hands. The Ministry of Road Machines has a training center near Moscow for improving qualifications and next spring the Director will go there for three months. (The director indicated he was looking forward to this session because the best specialists would be giving lectures. The Chief Engineer would run the plant in the director's absence.)

Since 1964, they have stressed automation of the manager's work. There is a computer center at the factory and they are getting a new computer next year. The computer center operates 17 hours a day and 40 specialists are associated with the center. At first the poor programs led to much discontent but now the center is much appreciated.

The Director, Mr. Andel, explained the principal uses of the computer as being for planning, salaries and inventories. The two items of particular interest to him were:

- 1) production for each day
- 2) income from production

Just now, the Director is concerned with the next 5-year plan. The goal is to increase production by 15% each year. There are no more workers in Estonia and he can not count on building additional facilities so he must plan on increasing productivity. The Director said that when he came in 1961 there were 300 more people at the plant than now but that productivity

has increased from 25 excavators per month to 170 a month. (The design changes only once in 10 years.) There are several approaches to improving the productivity of managers including that of a special laboratory at the factory on scientific organization of labor and management. The shop managers, for example, were giving lectures that day. Last year the Director gave a course to young specialists and there are study groups dealing with economic problems.

There are three levels of management at the plant. The director has 3 or 4 assistant directors. There are about 80 shop foremen under the assistant directors and about 15-20 people under each shop foreman.

We visited the computer center and the assembly line. The computer center seemed well run with the usual Minsk computer. The assembly line was also interesting--about 50 meters in length.

INTERINDUSTRY INSTITUTE OF TRAINING, RIGA

Soviet Participants

A. I. Andricson, Director
A. K. Krastinsh, Deputy Director
N. T. Ivanov, Dean, Management Faculty
M. Frobtuk, Dean, Economics Faculty
I. V. Staaran, Dean, Engineering Faculty
V. P. Nikishin, Chairman of Department
G. A. Forshin, Chairman of Department

The Director, Andricson, gave an overview of the institute. There are about 5000-6000 students per year. The motivation is the need for high quality people and there is a strong emphasis on retraining for managers, for example, organizers of production. This institute is one of several of this kind in the U.S.S.R. and is concentrating on supplying specialists for Latvia. Students range from deputy ministers to shop managers (foremen). There are also special courses for secretaries to people holding these positions.

The Director made several observations on the scope and structure of the institute based on their experiences. The institute has several Faculties that are useful for coordination. There are 13 chairs (departments) under the Faculties. The main part of the training is conducted by the regular staff but others are invited in also from enterprises, the Latvian Academy of Science and elsewhere. When they are building up the institute they consider a broad range of needs for higher education and research as well as the needs of workers.

Most of the staff of the institute have candidate degrees and 10 of the staff members have received their candidate degrees over the last few years. Also the staff itself receives refresher courses at intervals ^{of} 1 year, 5 years, etc. The Director of the institute and the heads of the faculties have special councils to discuss grading and training of staff. The Faculty of Management trains Deputy Ministers, Director of Plants, Directors of Economic Associations. The Faculty of Economics is concerned with heads of economic establishments and heads of economic services in plants. The Faculty of Engineering is interested in chief engineers, etc.

In regard to the methods used, the Director had the following comments: By complex training, a combination of theory, economics and psychology was implied to give a broad background to trainees. The training was individualized in that the scope of knowledge needed by a deputy minister differs from that needed by a chief engineer. They are working out new methods of training involving lectures, active forms (case methods), etc. The length of the training sessions range from a two-week informational course to six-month courses. They have both full-time and part-time students. They also train people as a reserve for higher positions as well as provide training appropriate for those in a given position.

One approach used involves three parts: first, a session at the institute; second, a return to the trainee's plant where a paper is started; and third, a session at the institute where the paper is completed. Trainees go through placement examinations so that the instructor will know what to expect and can adapt methods to accommodate special groups.

It is the intent to have the next higher level of supervision present at the trainee's defense of a paper. A council also looks at the pros and cons of a paper and is instrumental in effecting its implementation.

Some research is also conducted at the institute, particularly on the improvement of management training and the optimization of the training process. The institute has funds contracts with ministries, enterprises, etc. for work which is done at the institute.

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Professor Ivanov described the Faculty of Management. The faculty has 4 chairs and 2 laboratories. Several thousand managers go through the Faculty. The teaching staff numbers 50 professors and instructors and about 50 professors and instructors and about 50 others are invited from the outside. The staff also give service courses to the other Faculties.

In one program for training managers, there are 240 hours of classes and a paper on some aspect of the organization of management. Experiences in other enterprises are also studies. Topics covered in the program included:

- theoretical methods
- economic methods of socialist problems
- problems of different branches of industry
- informational base of management
- computer techniques

From 10 to 15 percent of the curriculum is devoted to law and management, for example, administrative law, labor law, etc. They have a special chair devoted to law and management and suggested that they may be pioneers in building courses coupling law and management. One course is on the juridicial aspect of automation.

One of the features of the 9th five-year plan is training. There are three steps:

- 1) a complex training program
- 2) applications of management information systems
 - short courses
 - advanced management methods based on automation

(all deputy ministers and heads of committees of Latvia have undergone courses)

3) more detailed methods (at Shorin's institute for example)

The Faculty of Management also trains people in systems analysis, electronic data processing and programming. By way of example, a group of deputy ministers would be left alone in a room with the computer to overcome self-consciousness. There are many special courses, too, for example, courses for heads of departments of Ministry of Communal Affairs (housing, etc.). There is close cooperation between the teaching staff and the enterprises and state organizations. This is close contact, too, with other similar institutions in the U.S.S.R.

Professor Frobtuk described the Economics Faculty. There are three Chairs in this Faculty:

- Planning and Organization of Production
- Economics of Separate Branches
- Accounting

There is an emphasis on increasing labor efficiency. Classes contain about 18-25 trainees. Refresher courses are given for people engaged in economic problems at enterprises. There is some teaching on location at enterprises. In some cases contracts are signed with enterprises for teaching on specific topics.

Topics of research include ways and means of improving methods of teaching managers.

Professor Staaran the Dean of the Engineering Technology Faculty described his program. There are 5 Chairs including ones on energy, housing construction, labor safety and environmental protection. About 1000 students per year receive training and even the instructors receive refresher courses. The training is in two parts--a broad program

applicable to all and a problem-oriented portion which is individualized. There is an emphasis on the final papers of trainees.

The topics for the final papers are close to the activity of each trainee. Possible topics are developed by a ministry or enterprise and final selection is made by the staff. When a topic is selected, the chief engineer is informed. There are three parts to the paper--management, economics and engineering technology. On completion of the papers, most are recommended for implementation and the papers are used as well in the class by the instructor.

The chief of the Chair of Theory and Practice of Management emphasized two thrusts:

- 1) Introduction to Management. The main emphasis is on theory and practice of management and its implementation. They deal mostly with people from shop manager up to deputy minister.

- 2) Automatic Management Systems in Organizations. The 3rd generation computer has changed their thinking. For example, in training system analysts and other electronic data processing specialists, they work in close contact with research problems in order to prepare special training literature.

They are now looking at the 10th five-year plan, particularly for a model of specialists (linked to the level of the specialist). In this they are guided by directives from the Party.

The Director of Computer Services explained that the institute shares computer facilities with Riga Polytechnical Institute. An EC 1030 is available (this was not confirmed at the Polytechnical Institute) and is only a 15 minute drive away. Apparently there are no terminals on-line

as yet. At the institute there is an emphasis on training high level managers to use computing techniques. There is also training in operations research and programming.

Due to lack of time we saw no classrooms at the institute.

RIGA POLYTECHNICAL INSTITUTE

Soviet Participants included:

- I. N. Ilyin - Pro-rector
- A. I. Strakov - Pro-rector for Scientific Research
- V. A. Freimanis - Pro-rector
- A. N. Borisov - Chairman of Department
- I. A. Stazdin - Chairman of Department
- L. V. Nitsetsky - Chairman of Department
- L. P. Leontyev - Chairman of Department, Engineering Economic Facility
- O. B. Lyusin - Chairman of Department
- A. P. Spalvinsh - Chairman of Department
- V. A. Briedis - Chairman of Department
- V. L. Nazarov - Chief of Computer Center
- Barishnikov - Automation Faculty

Pro-rector Ilyin made several introductory remarks. The institute was established initially in 1862 and became a full institute in 1896. It was apparently closed for a time and reopened in 1968. Many scientists have graduated from the institute including Keldysh's father. There are about 1500 staff of which 500 are part-time. About 40% of the staff have scientific degrees. There are 14,000 students of which 7,500

are full-time students. There are 40 specialities in 14 Faculties. There are a total of 67 Chairs and 180 laboratories. Specialities include radio technology, chemistry, electrical energy, mechanics and machine building, automation, instrumentation in industry and engineering economics. There are nine problem-oriented laboratories, six of which deal with specific branches. There is also a science library and a computer center.

The curriculum is worked out in accordance with the Ministry of Higher and Specialized Secondary Education. They are transferring to new plans which were approved last year. There are a total of about 5,000 hours in the full course including about 1000 hours of practical training. There is a strong emphasis on training methods and also emphasis on self study and on scientific research. Computer techniques are used in both education and research. The computer center is an interinstitutional center (the Interindustry Institute of Training used it, for example) and 7 or 8 faculties have separate computer laboratories with small computers. A goal has been set of training all staff members in computer techniques by 1978.

There was a strong interest in athletics with 30 sport sections that compete in republic, all union and international competitions. Prorector Strakov described the scientific research undertaken at the institute and with some branches of industry. The state financing permits the establishment of a permanent research staff. About 1/8 of all the research funds come from the state. There are 9 laboratories financed with state funds engaged in fundamental research. Another source of financing is the contract research which accounts for the other 7/8 of the research budget. In regard to the organization form, laboratories are often established for certain sectors of industry if there are long-term needs. Special groups are often established to solve short-term problems.

About 700-750 people are engaged in scientific research at the institute through either state or contract financed research. Professors are required to take part in research. Examples of laboratories included:

- X-ray lab for both state and contract research
- lab for research on concrete
- lab for synthesis of chemical substances supported by contract research

The institute tries to choose projects that match interests of institute with emphasis on projects that are compatible with the research being conducted on basic topics. Two laboratory heads were present: one concerned with the psychological and physiological basis of the scientific organization of labor and the other concerned with simulations. There is also a special postgraduate course in which there are 220 postgrads enrolled.

Another chairman reported on a proposed integrated data processing system covering all of higher education for the Latvian Ministry of Higher and Specialized Secondary Education. The basis will be a shared computer center to be developed from the present center and which should be operational by 1978. The project has been underway two years and started with a special study group in management systems. The center will have a major student enrollment package and a data bank on all students in the republic. By 1978, it is hoped that the system will also be linked to population data of the republic.

Dr. Leontyev, of the Engineering Economics Faculty, described their work with mid and lower level managers. They were concerned with the three fields of machine building, construction and light industry. The main aim is to bring about good decisions from an economic viewpoint. Subjects include

mathematics, social economics, economics, technical subject-both special and general.

There is, in particular, a Chair of mathematical models which was founded in 1969 including topics on computers and programming for the benefit of engineers and economists. Subjects taught include higher mathematics, programming, linear and nonlinear systems, mathematical statistics, probability, mathematical models in economics and operation research.

Much attention is given to students working with computers using the PL1 and assembly languages. A strong mathematical foundation is stressed in papers. Recently, students were kept for an additional half year for extra work on management information systems. Included were 120 hours on coding and programming with much of the time spent on the computer. The case method of study is also used.

The Faculty of Automation was described by Barishvnikov (who had been at the Artificial Intelligence Conference at Tbilisi in September). The Faculty is only a few years old. The stress is on automatic control and the concentration for the past five years has been on management information systems for

- plants or enterprises
- ministries
- technological processes

The aim is at design as well as the modelling of such systems. Within this broad thrust students are given a range of subject including MIS, automatic control, systems analysis, operations research, modelling of systems (simulation), theory of computing systems, reliability and computer-aided design. Questions of economics amount to about 7% of the work. Subjects

in mathematics make up about 30% of the work. Study of computers is carried out with the assistance of a special chair of computers. Software teaching is also carried out by other specialists. Students receive practical training in designing management information systems.

Nazarov described the Interinstitutional Computer Center. The facilities are shared by several institutions and consist of Minsk 22 and 32 computers and a MIR II. They expect to have a EC 1022 by the end of the year. (The Interindustry Institute of Training had mentioned an EC 1030 as being available). The Center is organized in three departments: technical, software and automated management systems.

By the 1st of October 1975 the Center will have administrative control over all computers used by other chairs in order to provide better physical and administrative coordination for educational and research use. Four display terminals have been purchased thus far by different chairs and teletype writers are also used. A new campus is apparently under construction which will include a computer center. The facilities of the center are being shared by 10 higher educational institutions in Latvia including 7 in Riga together with 2 pedagogical institutes and 1 agricultural institute.

Mr. Letovsky (not listed above) described the section concerned with the idealology of computers within the Computer Center Department. They work with all Faculties except economics. ALGOL and FORTRAN are studied. The application of computers is emphasized in papers and the central computer center may be used for large problems. There is also training in system problems with a narrow specialization in software. The courses are as follows:

1st course - FORTRAN, small computers, programming, uses of
computing techniques

2nd course - assembler (like IMB 360)

3rd course - PL1 (ES 1020, 1030: They buy computer time)

4th course - theory of compilers

There is a special research group on defining new job functions.

Other organizations that have special groups for this purpose include the Latvian GOSPLAN, the All-Union GOSPLAN and special commissions of the Ministry of Higher and Specialized Secondary Education.

There is also ~~retaining~~ training in this area. About 100 teachers are given 80-100 hours of training each year.

The head of the laboratory of the psychological and physiological organization of management gave a brief overview of his laboratory. Included were topics on optimum schedules for work and rest, methods for economic efficiency and criteria to be applied. He mentioned ways and means of ^{learning} leaving languages while asleep. Very little work was being done in connection with groups.

Spalvinsh described the laboratory on simulation games. Hybrid (digital /analogue) computer systems are used to solve problems in field theory. He was concerned with how to introduce young people to science and noted that 70% of the science output was done by 5% of the scientists.

Again, the schedule did not leave time for visits to classrooms or laboratories - particularly so since the institute was housed in several buildings.

RIGA WHOLESALE TRADE OFFICE OF CENTRAL UNION
AND LATVIAN UNION OF COOPERATIVE SOCIETIES

We met with R. I. Denisov, Director, and with G. Grivinsh, Chief of Computerization Techniques and MIS Department, State Planning Committee, Latvian SSR. This visit was not on the scheduled itinerary and was presented as a surprise.

Mr. Grivinsh discussed the function of the trade office and other business organs under the ministries as the improvement of the system of regional planning. They are creating complex systems of automated management. There is a main territorial computer center at the level of the Latvian Council of Ministers. There are also territorial computer centers for collective use and at the same level there are separate branches with their own computer centers. All link with the main center for information exchange and for solving complex problems. The central link is ACTTP. One branch system is for trade, the split between urban and rural trade being about 50-50.

The Interindustry Institute of Training is involved and work is also being done at higher educational institutions as the University or Riga Polytechnical Institute. Each branch of industry has its own training system concerned with training of lower management. The emphasis is on existing managers more than young specialists.

Mr. Denison described the Wholesale Trade Supply. About 2600 trade enterprises receive commodities from 2000 enterprises and firms. There is an assortment of 65,000 items (200,000 including the variations). The freight turn-over is 235,000 tons (time period missing). There are 800 people on the staff. Ten percent have higher education or specialized secondary education. Only 47 have no secondary education.

The application of computers started in 1967. To date they are dealing with training of the management staff. At the beginning there was no training institute for trade and people were sent to Riga State University for refresher courses. Almost all managers have undergone refresher courses including the director. In-house courses are given on psychology, cybernetics, etc. All staff members receive orientation.

As a result, they are devising methods as well as basic materials. It was noted that the methods do have some faults. Not enough attention is given to research because the methods are governed by the empirical approach. There is some gain in speed with less ^{bureaucracy} ~~beaucracy~~. One of the problems solved was that of the automation of presentation of data.

We visited display rooms and the computer center. We were told the facilities included 180,000 square meters and 18 kilometers of corridors. The display rooms were neatly arranged rooms of articles produced in the Soviet Union. We saw only a few rooms including glassware, sporting goods, musical instruments, clothing. We understand that not all articles were on display--some were in catalogues. We were told buyers would come in during mornings and make selections. (Our visit was in the afternoon and we saw few people that appeared to be outsiders during the visit.) Data was captured so as to be readily put in machine-readable form.

The computer center appeared to be one of the best run we had seen. The facilities consisted of a Minsk 22 and 32. They hoped to acquire an ES 1035 (they might be sent an ES 1032). (These models of the ES series appear to more advanced versions of the original production models).

We also received some descriptive materials on the Riga Wholesale Trade Office.

INSTITUTE FOR MANAGEMENT OF THE ECONOMY

We met with the following:

V. G. Shorin - Rector

L. I. Strennikov - Pro-rector

A. P. Polezhayev - Professor

A. S. Roshchin - Professor

V. S. Bobintsev - Associate Professor

Shorin provided an overview (the Computer Applications Working Group had previously met with Shorin in July 1973). The institute is organized to provide a well-established system of management training. The U.S.S.R. has had a system of improvement of qualifications at lower and mid levels of management for some time. The Institute for Management of the Economy is directed at Ministers and Deputy Ministers from both Republic and All Union Ministries, Chiefs of Main Departments and Directors of the larger enterprises.

The curriculum is 3 months in duration. Trainees already have a candidate or doctorate degree. There are 4 main topic areas in the curriculum:

Gvishiani - Principals of economic development and how it applies to socialist economics.

Glushkov - Use of mathematical methods and models at level of national economy, ministries and enterprises

Lornov (Director of Institute of Psychology of the Academy of Sciences) - Social and psychological aspects of management

Fedorenko - Use of automated information systems in management
and decision-making

Shorin made the following comments: not all problems are solved through the market arrangement. National planning is needed, but still they are not always happy with the State Planning Committee. Computers are used in planning at the All-Union level and at the regional level.

A new facility is under construction in southwestern Moscow including the school, a computer center and hotel.

The experience thus far has established the desirability of other institutes in the Republics and they now have similar institutes in Kiev, Minsk and Central Asia which make use of the methods and curriculum at Shorin's institute.

In regard to the program, each trainee receives 70 books and other materials. The class week runs 5 1/2 days. Lectures are given in the morning and seminars and labs are given in the afternoon. All trainees work with the computer for 4 hours per day four times per week. There are no examinations. Each trainee prepares a graduate essay (project). The projects are implemented and the applications are followed up with reports on the results from the ministry once a year.

For the most part Shorin indicated they are pleased with their work.

Titles of some of the books that are used included the following (we were given copies of these books):

- ~~Current~~ ^{Actual} Problems of Management
- ~~Economical~~ ^{Methods and} and Mathematical Models of Planning and Management
- ~~Introduction to Automated Management Systems~~ ^{of Management}
- Introduction to Cybernetics- ~~Automated~~ ^{Systems} of Management
- ~~Computer Programming~~ ^{Problems of the Management of Science during the Scientific-Technical Revolution}
- ~~Juridical~~ ^{The legal and} Social and Psychological Management Aspects of Automated Management Systems

- Systems Analysis and Management Structures

About ^{40,000 - 50,000} ~~100,000-150,000~~ copies were printed, ^{if most of the books.} A collection of about 6 books is being used on topics about enterprise automated management systems.

There is no permanent teaching staff. The permanent staff that is at the institute is concentrating on research and methodology. The instructors come from research institutes and industry.

Trainees vary somewhat and the number of trainees at a time depends on the course. The present building will accommodate no more than 80 students. The new building will accommodate 300-500 trainees at a given session. Once every five years people will be invited back.

By way of example the schedule for the preceding week included instruction on the following topics:

Introduction to Economics

Probability and Statistical methods

Optimum Functions of National Economy

Problems of Improvement of Economic Mechanisms

Psychology of Labor

Introduction to Decision-making

Shorin's view on business games was that they were possibly useful as an analytic technique. Trainees however should think in terms of problems and should not be given "pills." He felt also that the construction of games was expensive--on the order of \$100,000-150,000. In regard to the case method, the prevailing feeling is that the method is static. (There is a real need to improve procedures and terminology.)

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An example was given of a trainee project that was carried out at the end of 1972. The problem, a Ministry problem, was one of placing optimum orders--and to do so without additional investment. The problem was solved with the help of trainees and staff and the application of the solution resulted in 833,000 rubles profit the first year and 1,200,000 rubles the following year.

Six basic centers are affiliated with the institute

- Computer Center of GOSPLAN
- Computer Center of Academy of Science
- Computer Center of Central Economical Mathematics Institute
- Center for All Union Research Institute for Management Problems
- Institute of Management
- (missing)

Shorin commented that the next five-year plan would be devoted to quality.

A possible joint project proposed would involve a small working group of 3-5 people from each country. The group would attempt to develop recommendations for organization of management in enterprises from viewpoint of high level managers and would assess possibilities in each country. Case studies might be used and Shorin felt that the models would be of use to the Soviet side.

We received a collection of a half dozen books on lectures given at the institute and we expect to receive other materials later.

ZIL AUTOMOBILE FACTORY

Soviet participants included

V. V. Kalinin - Deputy General Director

A. P. Lizo - Rector, ZIL Technical Institute

V. N. Mosin - Chairman of Department, ZIL Technical Institute

M. N. Churaryov - Deputy Chief, External Relations Department

The Corporation includes 12 affiliated factors, some outside Moscow. The major product is trucks. The factory (a small workshop) was founded in 1916 by brothers who were well known capitalists in Tzarist Russia. After the October revolution the Soviet government decided to build a factory and on November 7, 1924, the first 10 cars were produced.

There are 100,000 employees. The factory has the latest production equipment and makes extensive use of conveyor systems. The factory is nearly self-contained in that it makes all parts except glass, lights, and electrical components. Even tools are made within the factory. Therefore a large technical staff is needed.

ZIL has its own technical school which provides 8 years of instruction. The first three years correspond to secondary education (they provide secondary education for those who come without it). Students are workers and graduates stay with the factory. The institute was established following a request to the government in 1960. There is also a business school within the factory with a three-year course.

The work at the factory is closely related to a student's studies. In the 4th or 5th year, students work as engineers. There are 100 full-time students and 100 part-time (the reference is missing).

The lowest level of student is a foreman. Managers assume positions while acquiring training. There are about 75 part-time students per year in the management school and about 100-200 total over 3 years. The intent is to meet only the needs of the factory.

In the overall industry 20,000-25,000 go to refresher courses annually. The planning system is based on a 5-year cycle and every engineer goes through a retraining cycle. Trainees visit other factories and also must read much literature in the field. In addition there are special courses and individual training for special jobs. Seminars of two-week duration are held for the purpose of describing the latest developments.

Production managers take a three-year program which meets 3 or 4 times a week. Courses include problems of labor and Soviet law, economic development of large factories, and organization and planning of machine building factories.

The computer center is largely concerned with administrative problems such as material and technical supply, inventories and payroll. They have a Minsk and an Ollivetti computer. There is little automation in the production lines.

We visited the truck assembly line--a single line perhaps 100 meters in length. It appeared to be moving about as rapidly as people could perform their individual tasks. Part of it was automated through overhead conveyor belts which supplies many parts, the engine, for example. Gasoline was put in the tank at a station near the end of the line and at the last station someone would drive the truck away. Trucks appeared to be coming off the line about every 10 minutes.

We received some descriptive literature on the trucks produced.

INSTITUTE OF THE USA AND CANADA

We met with Boris Milnor, Head of the Management System Department within the Economics Division and a research fellow in Milnor's department. Milnor is also a half-time professor at Moscow State University. He has also worked at Shorin's institute. The institute was established in 1968 as the Institute of the USA. Canada was added in 1974. Its purpose with reference to the U.S. is to study U.S. foreign policy to improve understanding of relations as well as to study the internal policies and ideology of the U.S. In the Economics Division there are two departments-- one on economic development under Ivanov and one on management systems under Milnor. There are 300 scholars at the institute and 20 in Milnor's department.

There are two sections in the Management Systems Department:

- 1) Methodological problems of management
- 2) Organizational forms of management

In addition, there are special goal-oriented teams. Yerenka (also at the Plekhanov Institute of National Economy) and Rappaport were two specialists assisting in this work. There is a study group of two people in the computer field and one of two people working on psychological problems. There is a small group working on the organizational forms of using the computer. (Kotchelkov, who I had met a year ago in the U.S., is in this group).

The scientific directions of the Department were described as

- 1) Organizational forms and structures

- trends in corporations, government, and other fields

2) Methodology

- operations research, programming, forecasting

3) Problems of management information systems

- problems related to industry

4) Human problems of management

- personnel policies, behavior

5) Management of nation-wide problems (started last year)

- studied TVA (with IIASA)

(Milnor is associated with the Large Organizations project at IIASA.)

The outputs of the institute are books and journals. Examples included a book on the Kama River project (the organizational system was initiated at the institute) and another on the Ural electrical project (Kamensk) from the organizational viewpoint. They have also published a book on the Organizational Structure of Management in Industry and another one on the theory and implementation of organizational design. They have published 14 books related to different topics of management in the U.S. and U.S.S.R. as well as other books on special topics. A book of some 60 cases was also mentioned (they wanted to publish 300 cases).

They have had contacts with the International Management Center in New York and Dayton (CIMCA ?).

Milnor mentioned a glossary project with Dick Sayer (?) of the Ford Foundation which apparently was not successful (26 terms were compared). Currently Milnor is working with the Mackenzie Corporation on a similar project. There has been an exchange of vocabulary but no complete results thus far. (Warren Cannon is the coordinator from Mackenzie's.)

Milnor mentioned that R. J. Miller (Ford Motor Co.--now at Stanford) was at institute for two weeks in May, Jim Hays gave two weeks of lectures about two years ago. Roy Ash was also there.

STATINTL

TRIP REPORT OF U.S. DELEGATION ON "COMPUTER-
AIDED REFINEMENT OF DECISION-MAKING AND EDUCATION OF
HIGH-LEVEL EXECUTIVES" TO U.S.S.R., SEPTEMBER 18-30, 1975 (01.0105)

INTRODUCTION

This trip was conducted as part of the U.S.-U.S.S.R. Program in the Application of Computers to Management which is being conducted under the U.S.-U.S.S.R. Science and Technology Agreement. The purpose of the trip was to meet with Soviet counterparts at selected academic, industrial and government organizations in order to develop a cooperative program in the topic area of "Computer-aided Refinement of Decision-making and Education of High-level Executives."

Members of the U.S. delegation making the trip were:

John E. Austin, Harvard University

D. D. Aufenkamp, National Science Foundation

John F. Lubin, University of Pennsylvania

In this report we relate briefly the substance of the discussions that took place at each of the institutions, organizations or factories visited. The RECORD of the meetings (attached) sets forth the proposed cooperative program developed by the participants.

The itinerary of the delegation was:

September 19 - Moscow

Ministry of Higher and Secondary Specialized Education
Moscow State University (meeting with Pro-rectors et al)
Moscow State University (Economics Faculty)

September 20 - Moscow

Ozdjonikidze Institute of Management (formerly Institute
of Engineering and Economics)
Plekhanov Institute of National Economy

September 22 - Leningrad

Leningrad Institute of Economics and Finance

September 23 - Tallinn

Tallinn Polytechnical Institute
All-Union Council of Scientific and Engineering Societies

September 24 - Tallinn

Management Training Institute, Ministry of Consumer Goods
Tallinn Excavator Factory

FILE 01.0105 - Computer Application
S+T

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September 25 - Riga
Interindustry Institute of Training

September 26 - Riga
Riga Polytechnical Institute
Riga Wholesale Trade Office of Central Union and Latvian
Union of Cooperative Societies

September 29 - Moscow
Institute for Management of the National Economy
ZIL Automobile Factory

September 30 - Moscow
Institute of USA and Canada
Central Economic Mathematics Institute

MINISTRY OF HIGHER AND SPECIALIZED SECONDARY EDUCATION (MHE)

Soviet Participants:

N. S. Yegorov, Deputy Director

N. N. Ivashchenko, Deputy Chief, Main Department of Higher Education
Institutions

A. K. Kalinin, Chief, Main Department of Scientific Research, MHE
of the RFSSR

V. V. Semin, Deputy Chief, Department of Personnel

A. M. Tsiganenko, Deputy Chief, Department of Instruction and
Methodology

The ministry is responsible for control of training of all specialists in education including those in management. It has cognizance over many types of institutions--universities, engineering institutes, medical, agricultural, etc. Questions of management are taken into account in all, and some universities are now putting particular emphasis on management education.

Both the Ministry of Higher and Specialized Secondary Education and GOSPLAN are looking at long range education policy in cooperation with other ministries. The State Committee for Science and Technology has a special institute for high level executives, the Institute of Management of the National Economy (Shorin). Also the MHE has one institute concerned exclusively with training experts who will work in different branches of industry, the Ozdjonikidze Institute of Management in Moscow (formerly the Institute of Engineering and Economics and, as we were told in March, renamed the Moscow Institute of Control and Management).

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MOSCOW STATE UNIVERSITY

Soviet Participants:

F. M. Volkov, Pro-rector

M. M. Maslov, Pro-rector

A. S. Pankratov, Deputy Pro-rector

M. V. Solodkov, Dean, Economics Faculty

A. N. Tikhonov, Dean, Cybernetics and Applied Mathematics Faculty

A. N. Leontyev, Dean, Psychology Faculty

The university provides training in nearly all fields (medicine is lacking, for instance). There are 20,000 full-time day students, 5000 part-time students and 2000 correspondence students. A total of 4500 assistants are being trained. There were last year 3200 specialists from other institutes in training and 3600 from industry. Full-time students have a five-year course of studies; correspondence students have a six-year course. Eighty percent of the students were said to be guaranteed a state stipend.

There are 3500 teachers and professors on the staff. Of these, 119 are academicians, 950 are professors and doctors of science. All staff take part in research as well as most students. There are several specialized institutes and many laboratories. Each year about 500 books and 800 articles are published by the staff.

In reference to the Economics School, the first two years involve fundamentals and include political economy, history, history of economics tasks and a wide range of topics in classical political economy. Specialization comes later, and graduates from this program have a good base for further specialization. "Planning" is in the Economics School and specialities include special courses on state budget, industry, standard of living, traditional methods of planning and applications of certain models. Traditional methods were said to be still in use in spite of all the theoretical work. Models have, for example, been useful in some cases, such as transportation, but apparently have not been so helpful in "social problems." There is no attempt to train engineers in the economics school.

Some off-hand observations: The Ministry of Higher Education has no contracts with industrial enterprises. It was also stated that there was some feeling that the Institute of the Management of the National Economy (Director, V. G. Shorin) should be under Moscow State University.

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At Moscow State University there is a system of economic "contracts"-- a contract with ZIL (the automobile and truck factory in Moscow) was mentioned. Currently, there are about 1000 contracts with enterprises amounting to 23,000,000 rubles.

Academician Tikhonov emphasized that the development of an educational program in "management" as such was not the goal at Moscow State University (MSU). Specialists are trained in technological management. On-the-job training is arranged on the basis of 3-year programs. The programs are different for people from industry with special interests and for students without such a background. They have tried to stress individual training for the people from industry. About 30% is on fundamentals but with emphasis on recent developments; 30% is on special courses to increase breadth of view and 30% is for very special topics. The work is carried out with small groups of 6 to 8 engineers each. Problems are often formulated by individuals from a specific industry which brings "reality" into the process. The "on-job" students are often of higher quality than those who are not. They would like to have as much individual training as possible but there aren't enough instructors for such a wide variety of instruction.

There is some research on economic control carried out in the School of Cybernetics and Applied Science. One job completed recently was for the consumer goods and textile industry. The contracts in economics with industry often involve large calculations; a second BESM 6 is being installed in the computer center. Tikhonov mentioned that he has an article in the Soviet Encyclopedia on mathematical models. He is also involved with industrial contracts on oil drilling research in which it was mentioned that the scientific foundation and electronic technology are very much dependent on each other.

There was a reference to special on-the-job training seminars for high-level academic executives, for example, the heads of Chairs from MSU and other institutes. This year the heads of Chairs of numerical mathematics were involved.

Possible forms of cooperation discussed included seminars, and exchanges of information. The experience with the Ford Foundation-sponsored seminars with New York University was mentioned. One possible subject for exploration might be a study of how scientific/technological systems are realized in both countries.

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MOSCOW STATE UNIVERSITY (ECONOMICS DEPT)

Soviet Participants:

M. V. Solodkov, Dean
U. N. Speranskaya, Deputy Dean
I. P. Faminsky, Deputy Dean
E. Z. Maiminas, Professor
V. N. Bronnikov, Associate Professor
G. N. Zoteev, Associate Professor
V. M. Yefimov, Senior Lecturer
V. J. Marshev, Senior Research Fellow
A. N. Sobronin, Postgraduate
A. V. Fadeyev, Postgraduate

We were informed that the Economics Faculty has been assigned responsibility for developing and implementing the technical program of Topic 5 in association with the Ministry of Higher Education. The Faculty of Economics was established in 1941 with three main sections: political economy, management, and cybernetics. There are 2000 students and approximately 300 are working on Candidate degrees. The Faculty (170 people) is organized into 13 departments, most of which have scientific laboratories. For example, the department of political economy has a laboratory on important issues of modern capitalism and one on studies of complex economic issues and conditions of developing socialism. The management department has a special section for management in industry, a laboratory for theoretical work, a laboratory on branch and territorial work and a calculating laboratory.

In the organization of the Economics Faculty, the Dean has four deputies including one for science, one for international affairs and one for economics. There is an Administrative Council associated with the Dean's office which includes student representation. It is concerned with all aspects of development of the Economics Faculty.

We visited also the Center for Problems of Management within the Economics Faculty. It is under the overall direction of Popov and cooperates with many foreign institutions, such as INSEAD in France and IIASA in Vienna. There are four parts: a laboratory for theory of management problems (Marshev is associated with this laboratory); a section on industrial management concerned with branches of industry and regional

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management; a Chair for education programs under Bronnikov; and a laboratory for "active" (i.e., case) methods for training and management games including interactive approaches. (Gvishiani wrote a book on management while at the Center in its early days. The staff has gone from 8 to 80 since Gvishiani's time.) The student body includes staff specialists for managers at all levels up to ministers and also teachers of management in addition to the usual university students. The students go to different enterprises for practice before receiving diplomas. Some go to IIASA. The university students are in the age range of 19-23. Most go to enterprises before they return for their diplomas.

Some tentative Soviet proposals for cooperation under Topic 5 were presented and included systems of management training, planning and forecasting of managerial resources requirements, methods of training, computer applications to management training and simulation games as tools for high-level management training.

OZDJONIKIDZE INSTITUTE OF MANAGEMENT, MOSCOW

Soviet Participants:

- M. A. Bishaev, Pro-rector
- V. S. Rumyantsev, Dean, School of Computer Services
- G. A. Bryansky, Dean
- F. J. Mamontov, Chief of Chair of Computers
- I. V. Kuznetsov, Doctor of Economic Sciences
- I. A. Ivanov, Associate Professor

Dydorian, Head, Chair of Information Management Systems

The director of this institute is Ms. Koslova. This institute was formerly called the Institute of Engineering and Economics. At the time of the visit of the U.S. delegation on educational technology in late March (under Aufenkamp), Bogomolov (MHE) told us the name of the institute had been changed that very week to the Institute of Control and Management. (Director Koslova was not present in March either. Mamontov who had been on the Soviet delegation to the U.S. on Topic 5 in December 1974 was present both times.) The visit in March had been to the old building in Moscow. This visit was to the new campus being constructed on the outskirts of Moscow.

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The Pro-rector, Bishaev, said that the institute is primarily a teaching institute but based on scientific research. There are two general thrusts at the institute:

1) "Elaboration of Model of Scientific Basis of Management"

2) Methods of preparing case methods and using computers with it

Special attention is given to information systems and modeling.

Kuznetsov described some of the philosophy of the institution in regard to its program in economics. He stressed the need for theoretical work in the field of systems of management. The different aspects of management include the organization and technical side as well as the socio-economic side. They have the opportunity to cooperate with many countries and can use some of the achievements of foreign countries. He indicated that the Soviet system of national economy has some aspects which clearly are different than those of the U.S.A.

Kuznetsov indicated that they were interested in American experiences in top management especially the management of major departments and their functions. He is also interested in behavioral theory relating to interactions among people as it affects the organizational/technical side of management. He again stressed that the work on the technical side of management parallels work in some other countries but that the work on the socio-economic side has some differences.

Ivanov discussed general questions of training managers. They try to train managers to solve problems which can be "formalized." By "formalized" he said he meant problems which could be solved by computer--the relationship between "formalized" and "unformalized" problems being most interesting (!) and that the "unformalized" area must also be studied and researched.

Bryansky mentioned that in working out the general principals of preparation of specialists they take into consideration the characteristics of the country. Some possible topics for cooperation that he mentioned included (1) modeling and decision problems on a national basis as well as on the regional and branch level, and (2) forms and methods of teaching (he is preparing a text this year to be published next year). He mentioned, too, that students prepared case studies.

Mamontov described the curriculum as it related to computers. Students enter at age 17 and begin to study computing from the first year. They start with simple computers and from the 2nd and 3rd year work with the ES series. Some work is of a general nature but students get practice in special computer centers for about six weeks on problem solving. Term projects are also assigned and we were shown examples of reports on the projects.

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Professor Rumyantsev who is Dean of the Faculty of Computer Sciences indicated that computers are not used extensively at the upper division level--only a few hours of practice. They expect to introduce time-sharing computers with the completion of facilities in a new building. They now use the NAIRY II and the ES 1020 systems. Languages taught are PL1, FORTRAN, RPG and assembly (not COBOL).

Dydorian, Head of the Chair of Information Management Systems discussed four aspects to management information systems (MIS)--organization, information, technical and mathematical. One software package called SYNTHIS is in operation at the institute. It was said to be similar to a package called ORGANIZER. Another model (software package) is used for production schedules (apparently similar to PERT) and several other models are used in different types of economic calculations.

He described a course in automated management systems which was in three parts--(1) theory of MIS, (2) principles of MIS and (3) modeling MIS. The mathematics side of MIS had two parts: (1) creation of mathematical models of economic calculations and (2) creation of mathematical programs. Mamontov is responsible for mathematics teaching and Dydorian for instruction on modeling.

The data bank problem is considered from several viewpoints which have both theoretical and practical aspects. There is a special course on the treatment of economic data based on Glushkov's work. With the new programs in the institute (which lead to the change in the name) there is a much wider range of training of specialists. With this new thrust, there is a need for creating many new manuals and textbooks.

The computer center facilities were also visited which featured the ES 1020.

PLEKHANOV INSTITUTE OF NATIONAL ECONOMY, MOSCOW

Soviet Participants:

- I. G. Popov, Pro-rector (also Chairman of Economics Dept.)
- B. I. Iskyakov, Chairman of Department
- V. V. Ozira, Chairman of Department (Alumnus of Harvard Business School)
- A. V. Korchagin, Chairman of Department

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G. A. Yeremeyev, Chairman of Department

Bolubov, Professor in Ozira's Department

A. K. Kalinin, Chief, Main Department of Scientific Research,
MHE of RFSSR

The pro-rector described the institute and its programs. The institute is 68 years old. There are 14,000 students--5,000 day students, 5,000 evening students and 4,000 correspondence students. There are also special classes involving 2,000 students. The day students enter at ages 18-19. There are 5 applicants for each place at the institute.

About half the students are in the area of trade including topics as pricing, economic labor, cybernetics, industrial planning, purchasing and supply, finance, economic commerce and accounting. There is a placement plan for students--apparently a combination of MHE and State Planning Committee suggestions. Possibilities are made known to the students and the applicants work out a program with the dean. There is competition for places on merit. Representatives (recruiters) of employing organizations come to the institute to seek out good graduates.

Ozira described the postgraduate management program. This was started in 1965 along with some economic reforms. The special 1965 order created five new postgraduate programs, the others located at the Moscow Institute of Management (Koslova, director), Ural Polytechnical Institute at Sverdlovsk, Leningrad Industrial Engineering Institute (Segov, rector) and Kharkov Industrial Engineering Institute. The emphasis at these four institutions is on industrial management. At the Plekhanov Institute there is an industrial planning department and people are responsible for topics as planning and finance. For instance, the State Committee for Purchasing and Supply sends its executives to the institute for special training. At three of the other locations, there appears to be an emphasis on middle level production management.

There are 11 departments in this special postgraduate management program and two courses of study in each department. One course of study is six months in duration involving people in their late 20's to late 30's. The other course of study is three months in length on advanced management problems for heads of enterprises or deputies or those already in charge in republic planning departments. Students are mainly engineers. There is an attempt to combine management and economics in the instruction under the following three topics:

- 1) origins of industrial planning
- 2) supply and purchasing
- 3) planning of national economy

there are 200 graduates each year.

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New departments of organization (Industrial Management) are being established at Gorki, Alma Ata, Tashkent, Baku (specializing in oil) and Minsk (probably at the institutes of the national economy in these cities).

There is a total of 600 academic hours over six months including a thesis on practical applications. The organization supports the costs of its students and the students return to their regular jobs at the end of the program. Students keep their salaries and receive expenses and a field trip. An overview of the six-month program includes:

- 20 hours - economics and political economics
- 100 hours - national economic management
- 70 hours - national economic planning
- 30 hours - accounting and analysis of economic data
- 20 hours - economic statistics for industry and supply
- 50 hours - mathematical methods and computing machines
- 50 hours - industrial economics
- 50 hours - importance of management (social systems) for socialism
- 50 hours - problems of improvement of organizational planning and management of industrial enterprises
- 100 hours - economic planning (from supply viewpoint only)
- 20 hours - problems of finance, money, banking
- 20 hours - scientific basis of labor management
- 20 hours - Soviet law
- 10 hours - civil defense

Under topics in management, Ozira includes concepts, strategy, implementation, structure of management, problems of improvements. Ozira has designed a special course on decision-making including three cases which he uses. Ozira has seven faculty members in his department.

Iskyakov is chairman of the computer department. Communication with the machine emphasizes two points: applications of packaged programs and creativity. The facilities are based on the Minsk 32. They will have one of the ES series in a new building. FORTRAN and COBOL are used.

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The chairman of statistics (Korchagin (?)) described the statistics program. The department is large, containing about 40 members. They are exploring ways of introducing more use of computers in teaching statistics and also ways of improving the curriculum generally. Some of the topics include theory of production functions, statistics of forecasting, econometric model building, and the theory of taxonomy. The Ministry of Higher Education encourages these improvements in the curriculum and hopes to introduce new ideas for teaching statistics using computers and the use of computers in research. In one effort on building welfare functions with the help of computers, they tried to consider the dynamics of the system including factors as the index of industrial goods, consumption of services, consumption of information, and an integrated index of living standards. Some preliminary results were presented at a meeting in Warsaw.

(A reference was made to Goldenberg at the Federal Bureau of Statistics.)

Golubov, a professor in Ozira's department described a course in systems analysis and decision-making in management which included topics on decision trees and heuristics. He discussed the psychological barrier between system analysts and managers. His own speciality was models dealing with branch economy.

Yeremeyev made several general observations. In the current five-year plan, there is an emphasis on creating national computer systems. A problem arises when the quality of information is poor. Also too much information can be a problem as he said arose in trying to develop a system for the Ministry of Fisheries in which there was a daily report of 100 pages on ships. The problems are: What amount and kind of information does a manager need? How does one handle loss of information from aggregation? Also information is more than just formal information. Yeremeyev emphasized, too, the problem of optimization--of taking into account all factors, especially non-measurable factors. Managers must know the model including the sensitivity and limitation.

Several possible topics for cooperation were mentioned by the Soviet participants in the course of the discussions. Among these were

- 1) integrated indices of living standards
- 2) dynamic models of national economy, long-range economic forecasting (2 centuries)
- 3) macroeconomics - production functions
- 4) coupling teaching methods in modeling development with research in the same area
- 5) bringing together information on decision-making theory
- 6) research on improvement of electronic data processing systems from the viewpoint of decision-making

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Kalinin suggested that perhaps one form of cooperation might include 20 people in each country working together in a project area with two people from each country going abroad for long-term stays. At appropriate times, conferences on the results of these efforts could be held in both countries.

LENINGRAD INSTITUTE OF FINANCE AND ECONOMICS

Soviet Participants:

Y. A. Lavrikov - Rector

L. S. Tarasevich - Pro-rector

Yermolin - Dean of Faculty (micro economics, structure of industry)

I. M. Syroyezhin - Chairman, Department of Economic Cybernetics

I. V. Romanovsky - Professor

S. R. Gidrovich, Senior Lecturer (Syroyezhin's lab)

U. U. Kurolepin, Senior Research Fellow (Syroyezhin's Lab)

Minovsky, Faculty of Mathematics, Leningrad University

We were met at the airport by Syroyezhin on the Sunday preceding our visit to the institute. Syroyezhin has spent a year at Cornell. Also two members of the U.S. delegation on educational technology to the U.S.S.R. in March 1975 met with Syroyezhin.

The rector, Lavrikov, gave a profile of the institute. There are six faculties with full-time students. Yermolin is dean of the postgraduate faculty and training of executives as postgraduates. There are evening courses as well and branches of the institute in Murmansk, Novogorod and Vologda. There is a special faculty for foreign students. Students at the present represent 27 countries. One person will be coming from the U.S. There was one man from the U.S. two years ago and one in social economics from England. In all there are 320 foreign students mainly from Africa, Europe, Asia (India and Vietnam).

The student body totals 10,000 students. The course of study is 5 1/2 years with 2 1/2 years of general training including social science, mathematics and applied science, technology and 2 1/2 years of specialized training in 8 trades (there is both micro and macro economics). About 60% of the graduates stay in the Leningrad area and the rest go elsewhere.

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The staff numbers 720 (teaching professors). About 2,000,000 rubles per year are received for research. The scientific research deals mainly with automated management systems in industry, cost-benefit analyses, and regional balances. (Liontief was said to have been interested in the first input/output analyses on northern regions done at the institute--I believe in 1923.)

The institute is both a teaching and research institute. (In response to a question about whether there was much research in industry itself, the response was that there was little except in the very largest industries.) The operating budget is about 20,000,000 rubles per year. There is roughly a 70-30 split between teaching and research. Salaries can be augmented up to 50% through contract research.

Class size varies. Syroyezhin concentrates particularly on group methods--the class size ranging from a few students to more than a hundred. For example, there are 7 students in a class in his simulation laboratory. There has been some exploration of the use of programmed instruction with some success in languages and geography. Some programs have been acquired from the Institute of National Economy in Kiev. Two systems for languages have been acquired from Czechoslovakia.

Lavrikov gave his views on the characteristics of a good manager in response to a question. He emphasized

- 1) competence
- 2) scope of knowledge--ability to do macroanalysis plus a strong vertical insight ("In our society, the 'vertical' is more significant than the 'horizontal.'")
- 3) "dynamic nature" (business-like approach)

There was interest in the cost-benefit analysis effects of decision-making. And also much interest in U.S. methods at business schools. Reference was made to a special conference three years ago on U.S. and Soviet teaching methods. The pros and cons of short courses (1 week) versus 3 months or longer were discussed. A special school (or section) has been proposed for planners and organizers with a duration of one year. Training and retraining of managers is not, however, a principal responsibility of the institute although the trend is one of broadening their participation.

Lavrikov mentioned some of the proposed subtopics which would be of interest to him. Among these were

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- 1) methods of training
- 2) simulation techniques as a training device
- 3) computer use in training and retraining managers (with 2nd and 3rd generation computers)

Also it was suggested that the Leningrad Polytechnical Institute (which was visited by the educational technology delegation in March 1975) might have some interest through its industrial engineering programs.

Professor Minovsky of the Mathematics Faculty at Leningrad University and of the Economics Faculty as well suggested the possibility of the joint preparation of a special review of management training which would be published widely and then a follow-up effort with special teams of U.S. and Soviet experts.

Visits were made to several laboratories of the computer facilities. Presently, the institute has four medium-size computers of the Minsk class. They hope to get an ES 1030 later. There are many small machines--about 250 in all--of the MIR and NAIRY class. All students study FORTRAN, COBOL and ALGOL. A few classrooms and laboratories were visited also which made use of audiovisual teaching aids. Classes were in session and there were many students around in corridors and laboratories.

Syroyezhin arranged more detailed discussions on his interests that took place in one of his laboratories together with two of his assistants, Gidrovich and Kurolepin. Syroyezhin emphasized the following point in regard to business games: (Later--following a suggestion of John Lubin the term "collective decision games" was used. The Soviet terminology is "simulation-gaming models.")

- 1) formulation and development of theory of (socialistic) management and education in its application must be realistic
- 2) "games" are a particularly useful way to do this
- 3) in games--one of their objectives is trying to remove the teacher: so that "results" are clear without the intervention of a teacher
- 4) the real usefulness of games for managers and students is to make sets of priorities understandable to managers and to make them understand the available options in terms of benefits within a framework of priorities.

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In the use of computers, two almost conflicting views from the Soviet side were discussed. On the one hand, computers could lead to an increase in collective decision-making; on the other hand, that technology could be used to decrease decision-making. Syroyezhin is trying to design games to increase the collective decision-making process (as he defines it) and claims that in his games participants are made aware of the need that no participant has the right to claim his decision, rather than the decision of all, is the one which dealt with the system as a whole system.

Also, games are useful in the context of "ill-structured" problems as are many of the complicated business problems. The most difficult problem is to provide an understanding of dealing with diversity and complexity.

A series of games has been developed in the laboratory.

- 1) IMPULSE. This is the most complex of the games and involves a simulation of managing a whole economy. Three branches and nine enterprises are involved. The factors considered are

- raw materials
- industrial tools
- consumer goods

There are 1 to 3 products for each enterprise; the model includes problems of changing personnel. External resources include technical inventions, forms of production, and raw materials. In IMPULSE the decisions are made only in an individual branch because there are no interbranch connections. The government is a player as any other player but has the right to change the rules of the game within prescribed limits on the number and extent of changes during the course of the game.

All participants understand the priorities. About 80 decisions have to be made in the course of the game. Each economic unit consists of 3 people with 60 people in all. There are weekly meetings of all participants to receive new inputs, etc. In the 4 or 5 hours following each meeting the next "two years" are analyzed and this is followed by homework. (In response to a question Syroyezhin said no studies had yet been made of intergroup interactions.)

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- 2) EPOS. This game is representative of the second set of games created by Svetlana Gidrovich. EPOS I and II have been completed with EPOS III in the design stage. The game models the administrative structure of a generalized business with an overall coordinator and administrators of resources. All three versions are based on the bidding process. The starting point is an elaboration of the initial plan by the coordinator. The real point of the game was described as one in which the coordinator must sell the plan to the subordinates--an example was given of an enterprise asking for help in introducing a new product and the use of the game was suggested to explore alternatives. Both technical developments and social factors are included. The social factors include, for instance, factors as housing, vacations, day care centers.

EPOS received a medal at the Economic Exhibition in Moscow.

- 3) ASTRA (Administrative and Structural Analysis). This set of games is not used with students at the institute. ASTRA is international in scope and requires participants from the same technological background. There are three main elements:

1. judges
2. group simulating the problem
3. group simulating the management structure

There are several versions. Some versions involve movement of resources. ASTRA 1, 2 and 3 have same design base but different scoring mechanisms. ASTRA 4 has new features which are particularly useful in structural analysis of enterprise. One difficulty seems to be the "generation of situations"--having participants pose the particular situations and parameters that are to be used in play. We were told that experienced managers were manually enthusiastic about the game but would like to reduce the mechanics of playing the game.

For the future, the plans for each set of games are:

- 1) IMPULSE - expand on diversity and automate (this will take five years)
- 2) EPOS - few proposed changes
- 3) ASTRA - changes to account for more complex and subtle organizational structures

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Syroyezhin felt that ASTRA particularly would lend itself as a basis for cooperative projects involving comparisons of results of decision-making under Soviet and American management approaches. The games could be used as a path to a better understanding of the systems.

We were told by Kalinin, Chief of the Main Department of Scientific Research of the Ministry of Higher and Specialized Secondary Education of the Russian Federated Soviet Socialist Republic, that his department of research and development could be used as a test bed for introducing innovations brought about by the use of the game.) (Kalinin also mentioned a science R&D budget of 500,000,000 rubles.)

TALLINN POLYTECHNICAL INSTITUTE

Soviet Participants:

- N. Tiismus - Pro-rector
- R. Uksvarav - Professor of Organization and Management
- M. Habakuk - Associate Professor of Organization and Management
- O. R. Lillenuurn - Chief of Department
- W. Kracht - Management Information Systems

The pro-rector, Tiismus, gave an overview. This institute is relatively new--being established in 1936. The idea originated, however, about 1917 for a regional polytechnical institute. In 1920 there was a technical school in Tallinn, but it became an institution of higher education only in 1936. In 1940, for example, there were only 1000 students.

There are 5,000 full-time students, 4,000 part-time and correspondence students. (They expect 11,000 students by 1980.) There are 6 full-time Faculties--economics, energetics, mechanics, construction, chemical automation and electrical automation. Also there are evening and correspondence Faculties. In all there are 48 departments and 627 instructors and professors. Of these 62% have either the degree of Candidate in Science or Doctor of Science.

Teaching is carried out in two languages. Two-thirds of the students take courses in Estonian, one-third in Russian. Twenty-seven different nationalities of the U.S.S.R. are represented at the institute. Attendance is compulsory. Exams are given after each term. Half of the students live in dormitories and 81% have stipends.

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Almost all of the faculty engage in research either through contracts with industry or through state support. The contract research amounts to 2,500,000 rubles per year. The main fields of research are

- environment (there is cooperation with Scandinavian scientists on the bay)
- oil shale applications
- management problems and automatic control
- research in chemistry on glues for use in construction materials
- mineral fertilizer applications

There are many links with industry. Included are

- the practical experience via students, (for much of the time the students are at the institute)
- students who graduate assist the institute in some cases and propose new ideas
- qualification commission in which leading experts take part
- contracts with industry

Examples of work with industry included:

- thermo energy--construction of boilers for oil shale power stations
- assistance with the uniquely constructed outdoor stage that holds 30,000-40,000 performers (with an audience of 250,000 people)
- a contract with Estonian radio (150,000 rubles--apparently most contracts are much smaller) for survey sampling and analysis

The order of priorities at the institute is

- 1) training students
- 2) research
- 3) contracts with enterprises

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It was noted that there is a trend now for students to choose humanities over majors in technology, the order being economics, construction, automation, etc.

There are special qualification courses (extension courses) given at special institutes in Moscow, Leningrad, and Kiev for top management.

Uksvarav described the department of Industrial Management and Planning of which he is head. He was in the U.S. at the University of Chicago in mathematical biology and then at other places for about nine months. He is professor of organization and management with special interests in data analysis.

There are 150 day students in the department, 300 evening students and 300 correspondence students. He is trying to stress what would be needed for managers at the end of the century. There is a special experimental thrust in which students do an applied research thesis in cooperation with industry. The contract research involved problems of organization, relationships, staffing, education and decision-making. He mentioned one area of possible cooperation as a critical analysis of dynamic information systems for top management.

There were other comments. Tiismus stressed the need to educate managers so that mathematical models would be useful to them. Also it was mentioned that "fuzzy" systems are being studied with up to 1,000 situations and 500-1,000 variants. They are designing compiler-writing systems to work in problem-oriented languages. Another apparent project area concerned methods to analyzing manager's profiles.

We visited the journal library and the computer facilities. Twenty periodicals are published there. The library itself was new, exceptionally well designed, heavily used by students, and had a very impressive number of journals on display from many countries including the U.S.A. There appeared to be at least 600 journals on display. Technical journals are exchanged with 230 other institutions. The computer center was also well organized and included Minsk 22 and 32 computers and ES 1020 and 1030 computers.

Students were in abundance--both in classrooms, corridors and the cafeteria (a full lunch cost 60 kopecks). We also saw a new conference facility equipped for simultaneous translations.

ALL-UNION COUNCIL OF SCIENTIFIC AND ENGINEERING SOCIETIES, TALLINN

The meeting was chaired by Professor Uksvarav of Tallinn Polytechnical Institute. There were representatives from many groups. Included were

Institute of Soil Science (representative of management)

Ministry of Labor (staff utilization - formerly in management training in Ministry of Light Industry)

Science Research Laboratory of Estonian Planning Committee
(automation of planning - information preparation and software)

Estonian Institute of Information, Estonian GOSPLAN, (personnel management and social development)

Institute of Information (management of scientific information)

Ministry of Timber Industry (head of management dept.)

Tallinn Polytechnical Institute (Department of Planning -
Management of Information)

Estonian State Committee for Science and Technology

A management committee for the Council prepares a program for a six-month period. One part consists of talks by individuals and general discussions on topics of interest. Examples included

- a talk on the experiences of a member who took a special course on consulting
- discussion of certain problems of publications which resulted in recommendations to the publishing house
- a seminar on the role of the supervisor in enterprises. A paper was presented and there was discussion. (There were several repetitions of the seminar due to interest.)

The second part deals with problems of disseminating management know-how around the republic. All managers in the area meet to exchange views. (It was mentioned that they met with representations of a U.S. company in the spring.)

A general discussion followed in which questions of general interest were asked by both U.S. and Soviet participants.

MANAGEMENT TRAINING INSTITUTE, MINISTRY
OF CONSUMER GOODS, TALLINN

We met with the Director of the Center of Management and Scientific Organization of Labor, Jacob O. Portnoi, and the Head of the Training Department, H. I. Cala. Also present was the deputy director to Portnoi and two assistant, Talia Marja and Carlson. (Talia Marja's academic work was in social psychology at the University of Tartu. She had been with the institute only a few months.)

H. I. Cala described some of the work of the Center. She said that when the Center was created in 1961, it was called the Methods Center of Training. They had only short term courses initially. There are six department (possibly only 35 instructors). Departments include the following functions:

- 1) high level managers
- 2) refresher training for industrial specialists (formerly for high level managers)
- 3) refresher courses for mid-level managers
- 4) refresher courses for on-site workers
- 5) publications (programs on methods of training)
- 6) laboratory for active forms (case method) of training (puts into practice new forms of training)

There are 13 cabinets or programs for different industries with light industry. Courses are both full and part-time. Lecturers are drawn from ministries, Estonian Academy of Science, from industry and other places (but not from the Center itself). About 4500 workers are trained per year. The training of professional managers started in 1971 with 10 month courses. About 10-15 percent are top managers. There are 70 topics on themes in the courses for the range from director to secretary. Although the institute is under the Ministry of Consumer Goods, it assists all of Estonia.

Portnoi described more of the work of the center, its role in Estonia and especially recent program developments. There are many branches to the Ministry of Consumer Goods (light industry) including textiles (cotton, wool, etc.), leather, shoes, accessories, etc. About 37,000 people are involved in Estonia (750,000,000 (?) pieces (?) in 1975).

The new center was established in 1975 and operates under the contract system. There are 6 instructional divisions with 96 experts and specialists. Of the 96, 70 are workers from industry, the remainder have administrative jobs. They have a laboratory system of management and give special attention to improving qualifications. Each laboratory has 10-15 people. There is, for example, a laboratory of staff studies for training managers for light industry. There is a textile department, also information service

bureaus concerned with matters as norms of production. Labor conditions are studied from both the psychological and physiological viewpoints.

Included, too, are advanced methods of labor among workers. Films are shown of the best methods. They try to introduce and promote the best methods, including competitions among workers.

Since 1971, they have started to train high level managers to light industry and have trained four different groups thus far:

- 1) reserve of directors (people to be promoted) - 11 people
- 2) reserve for deputy directors - 10 people
- 3) chief engineers - 23 people
- 4) shop manager - 23 people

They have students also from Latvia and Russia. As of January 1975, statistics indicate that 54 percent received higher positions after graduating from this course.

Portnoi gave a detailed breakdown of the training given managers during the 10-month training program:

- 1) Selection procedures - higher education, 10 years of experience, personal capabilities to be managers. (They had no tests. Applicants were proposed by enterprises and selected by a commission. A few applicants refused.)
- 2) Theoretical training - 5 months
 - 240 hours of training of fundamentals of management in industry
 - 140 hours of economics and organization of labor in light industry
 - 70 hours of labor and personality in socialist society
- 3) Training in Enterprises - 5 months (in field of training)
Several topics are emphasized including organization of labor; management systems on level of shop, factory and higher levels; organization of management in functional spheres; and organization of system of management of enterprises generally.

- 4) Procedural Aspects - Each trainee is given a consultant (advisor). There is a strong emphasis on diploma projects which have both theoretical and practical aspects. The projects are often revised from both aspects in consultation with advisors including people from the enterprise. Finally the diploma project is defended before a commission consisting of the Deputy Minister and other experts from enterprises and academic institutes. Grades are from 1 to 5.

Portnoi noted a few of the problems encountered including differences in backgrounds of students which resulted in differences in progress. Also some institutes did not take the school seriously and did not send the best students. One special difficulty with the 10-month training program was that many people could not come for such a long period, so other programs were devised.

- 5) Examinations and Evaluations - Examinations are given in the theoretical aspects. The grade on diploma projects on the theoretical part are also taken into account in reference to the high level managers. For those applicants in the top two grades where the candidate degree is a prerequisite, no diploma is given. (The reference was not clear for the top two grades--possibly the director reserve and the deputy director reserve.) The third category, possibly the reference to chief engineers, measurably includes people who could make significant changes in a plant.

The training given was asserted to be very helpful--particularly since most applicants were good in technology but had little training in management. The work of the institute was judged to be very good by the U.S.S.R. Some 55-60% of diploma projects resulted in economic improvements.

Portnoi then described another program of training that covers a period of 1 1/2 years but will not take people from their jobs for long periods of time. The first course will begin in October 1975. There will be no formal selection process--groups will be simply formed by enterprises--although there will be some prerequisites. The groups will receive 350 hours of theoretical training. The program is diverse because of wide educational differences. Topics include theory of management, psychology of management, scientific origins of labor, selected topics in pedagogy pertaining to adults, and fundamentals of labor laws. This first two weeks of the program will be held at the institute. During the next six months, two days a month will be at the institute. This period will be followed by another two weeks in residence at the institute and another period of six months of two days per month at the institute. A paper is to be prepared by each student which pertains to the student's job. Each student will have an advisor and diploma papers will be revised from both the theoretical and practical viewpoints before implementation (a strong point is made of implementation of projects). Students will take an examination and earn a certificate (not a diploma). A prospectus on the Institute is appended to this report.

About 90% of the trainees at the institute have higher or specialized secondary education. There were six candidates of science and several candidates in medical sciences. Some were postgraduates. We learned, too, that about 90% of the trainees at the institute were women.

We visited several classrooms and met one group of about 20 trainees in the specialized program coming to call. (All were women--most appearing to be in their 30's.) Several of the classrooms were set up with semiautomated instructional aides with monitoring by the instructor of subgroup responses.

TALLINN EXCAVATOR FACTORY

The factory is under the Ministry of Road Machines. We met with T. Andel, the Director. He is a graduate of Tallinn Polytechnical Institute in 1955. He came to the factory in 1961 after being head of a small enterprise in Tallinn in 1957. Tallinn Polytechnical Institute is said to be the main source of specialists for the factory. He has visited 16 plants in the United States. He is probably 43-45 years old.

The factory produces excavators based on the design of the Belorussian tractor for continuous action drainage excavating. This is the only factory in the U.S.S.R. producing this product. The plant produces products for all the socialist countries and also exports products to 30 other countries. Service stations are maintained in Czechoslovakia, Iraq, Poland and the German Democratic Republic. There are also specialists in other countries.

About 1700 workers produce 2000 machines per year plus spare parts. The main plant is in Tallinn and branch plants for producing special components are located at distances of 90 to 200 kilometers. About 400 technicians and engineers are at the branch plants. The shop foremen have higher education and about 140 engineers and other specialists are graduates of Tallinn Polytechnical Institute.

There is a strong emphasis on the problem of increasing the effectiveness of workers. In these efforts, there are strong links with other institutes, such as the Tbilisi Polytechnical Institute and the Moscow Institute of Road Transport. The factory serves as a "laboratory" for institutes in that young students work as apprentices under the direction of old hands. The Ministry of Road Machines has a training center near Moscow for improving qualifications; next spring the Director himself will go there for three months. (The director indicated he was looking forward to this session because the best specialists would be giving lectures. The Chief Engineer would run the plant in the director's absence.)

Since 1964, they have stressed automation of the manager's work. There is a computer center at the factory and they are getting a new computer next year. The computer center operates 17 hours a day and 40 specialists are associated with the center. At first the poor programs led to much discontent, but now the center is much appreciated.

The Director, Mr. Andel, explained the principal uses of the computer as being for planning, salaries and inventories. The two items of particular interest to him were:

- 1) production for each day
- 2) income from production

Just now, the Director is concerned with the next 5-year plan. The goal is to increase production by 15% each year. There are no more workers in Estonia, and he can not count on building additional facilities so he must plan on increasing productivity. The Director, said that, when he came in 1961, there were 300 more people at the plant than now but that productivity has increased from 25 excavators per month to 170 a month. (The design changes only once in 10 years.) There are several approaches to improving the productivity of managers including that of a special laboratory at the factory on scientific organization of labor and management. The shop managers, for example, were giving lectures that day. Last year the Director gave a course to young specialists and there are study groups dealing with economic problems.

There are three levels of management at the plant. The director has 3 or 4 assistant directors. There are about 80 shop foremen under the assistant directors and about 15-20 people under each shop foreman.

We visited the computer center and the assembly line. The computer center seemed well run with the usual Minsk computer. The assembly line was also interesting but not particularly impressive--about 50 meters in length: it is of the "stationary type" with workers moving from station to station.

INTERINDUSTRY INSTITUTE OF MANAGEMENT TRAINING, RIGA

Soviet Participants:

- A. I. Andricson, Director
- A. K. Krastinsh, Deputy Director
- N. T. Ivanov, Dean, Management Faculty
- M. Frobtuk, Dean, Economics Faculty

I. V. Staaran, Dean, Engineering Faculty

V. P. Nikishin, Chairman of Department

G. A. Forshin, Chairman of Department

The Director, Andricson, gave an overview of the institute. There are about 5000-6000 students per year. The motivation is the need for high quality people; there is a strong emphasis on retraining for managers, for example, so-called organizers of production. This institute is one of several of this kind in the U.S.S.R. and is concentrating obviously on supplying specialists for Latvia. Students range from deputy ministers to shop managers (foremen). There are also special courses for secretaries to people holding these positions.

The Director made several observations on the scope and structure of the institute based on their experiences. The institute has several Faculties. There are 13 chairs (departments) under the Faculties. The main part of the training is conducted by the regular staff, but others are also invited from enterprises, the Latvian Academy of Science, and elsewhere. In developing the institute, they consider a broad range of needs for higher education and research as well as the needs of workers.

Most of the staff of the institute have candidate degrees, and 10 of the staff members have received their candidate degrees over the last few years. Also the staff itself receives refresher courses at intervals of 1 year, 5 years, etc. The Director of the institute and the heads of the faculties have special councils to discuss grading and training of staff. The Faculty of Management trains Deputy Ministers, Directors of Plants, Directors of Economic Associations. The Faculty of Economics is concerned with heads of economic establishments and heads of economic services in plants. The Faculty of Engineering is interested in chief engineers, etc.

In regard to the methods used, the Director had the following comments: By complex training, a combination theory, economics and psychology was implied to give a broad background to trainees. The training was individualized in that the scope of knowledge needed by a deputy minister differs from that needed by a chief engineer. They are working out new methods of training involving lectures, active forms (case methods), etc. The length of the training sessions range from a two-week informational course to six-month courses. They have both full-time and part-time students. They also train people as a reserve for high positions as well as provide training appropriate for those in a given position.

One approach used involves three tours: first, a session at the institute; second, a return to the trainee's plant where a paper is started; and third, a session at the institute where the paper is completed. Trainees go through placement examinations so that the instructor will know what to expect and can adapt methods to accommodate special groups.

At the trainee's defense of a paper, it is the intent to have the next higher level of supervision present. A council also considers each paper and attempts to have it implemented.

Some research is also conducted at the institute, particularly on the improvement of management training and the optimization of the training process. The institute has funds from contracts with ministries, enterprises, etc. for work which is done at the institute.

Professor Ivanov described the Faculty of Management. The faculty has 4 chairs and 2 laboratories. Several thousand managers go through the Faculty. The teaching staff numbers 50 professors and instructors and about 50 professors and instructors and about 50 others are invited from the outside. The staff also give service courses to the other Faculties.

In one program for training managers, there are 240 hours of classes and a paper on some aspect of the organization of management. Experiences in other enterprises are also studies. Topics covered in the program included:

- theoretical methods
- economic methods of socialist problems
- problems of different branches of industry
- informational base of management
- computer techniques

From 10 to 15 percent of the curriculum is devoted to law and management, for example, administrative law, labor law, etc. They have a special chair devoted to law and management and suggested that they may be pioneers in building courses coupling law and management. One course is on the juridicial aspect of automation.

One of the features of the 9th five-year plan is training. There are three steps:

- 1) a complex training program
- 2) applications of management in formation systems
 - short courses
 - advanced management methods based on automation

(All deputy ministers and heads of committees of Latvia have taken some courses at the Institute.)

- 3) more detailed methods (at Shorin's institute for example)

The Faculty of Management also trains people in systems analysis, electronic data processing and programming. (An example of a technique used is having a group of deputy ministers alone in a room with the computer to overcome self-consciousness.) There are many special courses, too, for example, courses for heads of departments of Ministry of Communal Affairs (housing, etc.). There is close cooperation between the teaching staff and the enterprises and state organizations and with other similar institutions in the U.S.S.R.

Professor Frobtuk described the Economics Faculty. There are three Chairs in this Faculty:

- Planning and Organization of Production
- Economics of Separate Branches
- Accounting

There is an emphasis on increasing labor efficiency. Classes contain about 18-25 trainees. Refresher courses are given for people engaged in economic problems at enterprises. There is some teaching on location at enterprises. In some cases contracts are signed with enterprises for teaching on specific topics. Topics of research include ways and means of improving methods of teaching managers.

Professor Staaran, the Dean of the Engineering Technology Faculty, described his program. There are 5 Chairs including ones on energy, housing construction, labor safety and environmental protection. About 1000 students per year receive training and even the instructors receive refresher courses. The training is in two parts--a broad program applicable to all and a problem-oriented portion which is individualized. There is an emphasis on the final papers of trainees.

The topics for the final papers are selected to be closely related to the actual work of each trainee. Possible topics are developed by a ministry or enterprise; final selection is made by the staff. When a topic is selected, the chief engineers is informed. There are three parts to each paper--management, economics and engineering technology. On completion, most are recommended for implementation. Completed papers are used as well in the class by the instructor.

The chief of the Chair of Theory and Practice of Management emphasized two thrusts:

- 1) Introduction to Management. The main emphasis is on theory and practice of management and its implementation. They deal mostly with people from shop manager up to deputy minister.

2) Automatic Management Systems in Organizations. The advent of third generation computers has changed their thinking. For example, in training system analysts and other electronic data processing specialists, they work in close contact with research problems in order to prepare special training literature.

They are now looking at the 10th five-year plan, particularly for a model of specialists (linked to the level of the specialist). In this they are guided by directives from the Party.

The Director of Computer Services explained that the institute shares computer facilities with Riga Polytechnical Institute. An EC 1030 is available (this was not confirmed at the Polytechnical Institute) and is only a 15 minute drive away. Apparently there are no terminals on-line as yet. At the institute there is an emphasis on training high level managers to use computing techniques. There is also training in operations research and programming.

Because of lack of time we saw no classrooms at the institute.

RIGA POLYTECHNICAL INSTITUTE

Soviet Participants included:

- I. N. Ilyin - Pro-rector
- A. I. Strakov - Pro-rector for Scientific Research
- V. A. Freimanis - Pro-rector
- A. N. Borisov - Chairman of Department
- I. A. Stazdin - Chairman of Department
- L. V. Nitsetsky - Chairman of Department
- L. P. Leonteyev - Chairman of Department, Engineering Economic Facility
- O. B. Lyusin - Chairman of Department
- A. P. Spalvinsh - Chairman of Department
- V. A. Briedis - Chairman of Department
- V. L. Nazarov - Chief of Computer Center
- Barishnikov - Automation Faculty

Pro-rector Ilyin made several introductory remarks. The institute was established initially in 1862 and became a full institute in 1896. It was closed in 1919 and was reopened in 1968. Many scientists have graduated from the institute including Keldysh's father (Keldysh was until recently the Head of the U.S.S.R. Academy of Sciences). There are about 1500 staff of which 500 are part-time. About 40% of the staff have scientific degrees. There are 14,000 students of which 7,500 are full-time students. There are 40 specialities in 14 Faculties. There are a total of 67 Chairs and 180 laboratories. Specialities include radio technology, chemistry, electrical energy, mechanics and machine building, automation, instrumentation in industry and engineering economics. There are nine problem-oriented laboratories, six of which deal with specific branches. There is also a science library and a computer center.

The curriculum is worked out in accordance with the Ministry of Higher and Specialized Secondary Education. They are transferring to new plans which were approved last year. There are a total of about 5,000 hours in the full course including about 1000 hours of practical training. There is a strong emphasis on training methods and also emphasis on self study and on scientific research. Computer techniques are used in both education and research. The computer center is an interinstitutional center (the Interindustry Institute of Training used it, for example), and 7 or 8 faculties have separate computer laboratories with small computers. A goal has been set of training all staff members in computer techniques by 1978. Another goal is that by 1980, all student papers will involve use of the computer for calculations. There was a strong interest in athletics with 30 sport sections that compete in republic, all union and international competitions.

Pro-rector Strakov described the scientific research undertaken at the institute and with some branches of industry. The state financing permits the establishment of a permanent research staff. About 1/8 of all the research funds come from the state. There are 9 laboratories financed with state funds engaged in fundamental research. Another source of financing is the contract research which accounts for the other 7/8 of the research budget. In regard to the organization form, laboratories are often established for certain sectors of industry if there are long-term needs. Special groups are often established to solve short-term problems.

About 700-750 people are engaged in scientific research at the institute through either state or contract financed research. Professors are required to take part in research. Examples of laboratories included:

- X-ray laboratory for both state and contract research
- laboratory for research on concrete
- laboratory for synthesis of chemical substances supported by contract research

The institute tries to choose projects that match interests of the institute with emphasis on projects that are compatible with the research being conducted on basic topics. Two laboratory heads were present: one concerned with the psychological and physiological basis of the scientific organization of labor and the other concerned with simulations. There is also a special postgraduate course in which there are 220 postgrads enrolled.

Another chairman reported on a proposed integrated data processing system covering all of higher education for the Latvian Ministry of Higher and Specialized Secondary Education. The basis will be a shared computer center to be developed from the present center and which should be operational by 1978. The project has been underway two years and started with a special study group in management systems. The center will have a major student enrollment package and a data bank on all students in the republic. By 1978, it is hoped that the system will also be linked to population data of the republic.

Dr. Leontyev, of the Engineering Economics Faculty, described their work with mid and lower level managers. They were concerned with the three fields of machine building, construction and light industry. The main aim is to bring about good decisions from a economic viewpoint. Subjects include mathematics, social economics, economics, technical subject-both special and general.

There is, in particular, a Chair of mathematical models which was founded in 1969 including topics on computers and programming for the benefit of engineers and economists. Subjects taught include higher mathematics, programming, linear and nonlinear systems, mathematical statistics, probability, mathematical models in economics and operation research.

Much attention is given to students working with computers using the PL1 and assembly languages. A strong mathematical foundation is stressed in papers. Recently, students were kept for an additional half year for extra work on management information systems. Included were 120 hours on coding and programming with much of the time spent on the computer. The case method of study is also used.

The Faculty of Automation was described by Barishnikov (who had been at the Artificial Intelligence Conference at Tbilisi in September). The Faculty is only a few years old. The stress is on automatic control and the concentration for the past five years has been on management information systems for

- plants or enterprises
- ministries
- technological processes

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The aim is at design as well as the modelling of such systems. Within this broad thrust students are given a range of subject including MIS, automatic control, systems analysis, operations research, modelling of systems (simulation), theory of computing systems, reliability and computer-aided design. Questions of economics amount to about 7% of the work. Subjects in mathematics make up about 30% of the work. Study of computers is carried out with the assistance of a special chair of computers. Software teaching is also carried out by other specialists. Students receive practical training in designing management information systems.

Nazarov described the Interinstitutional Computer Center. The facilities are shared by several institutions and consist of Minsk 22 and 32 computers and a MIR II. They expect to have a ES 1022 by the end of the year. (The Interindustry Institute of Training had mentioned an ES 1030 as being available.) The Center is organized in three departments: technical, software and automated management systems.

By the 1st of October 1975 the Center will have administrative control over all computers used by other chairs in order to provide better physical and administrative coordination for educational and research use. Four display terminals have been purchased thus far by different chairs and teletype writers are also used. A new campus is apparently under construction which will include a computer center. The facilities of the center are being shared by 10 higher educational institutions in Latvia including 7 in Riga together with 2 pedagogical institutes and 1 agricultural institute.

Mr. Nitsetsky described the section concerned with the idealology of computers within the Computer Center Department. They work with all Faculties except economics. ALGOL and FORTRAN are studied. The application of computers is emphasized in papers and the central computer center may be used for large problems. There is also training in system problems with a narrow specialization in software. The courses are as follows:

- 1st course - FORTRAN, small computers, programming, uses of computing techniques
- 2nd course - assembler (like IBM 360)
- 3rd course - PL1 (ES 1020, 1030: they buy computer time)
- 4th course - theory of compilers

Other organizations that have special groups for this purpose include the Latvian GOSPLAN, the All-Union GOSPLAN and special commissions of the Ministry of Higher and Specialized Secondary Education.

There is also retraining of instructors in computing. About 100 teachers are given 80-100 hours of training each year including both lectures and laboratory work.

The head of the laboratory of the psychological and physiological organization of management gave a brief overview of his laboratory. Included were topics on optimum schedules for work and rest, methods for economic efficiency and criteria to be applied. He mentioned ways and means of learning languages while asleep. Very little work was being done in connection with groups.

Spalvinsh described the laboratory on simulation. Hybrid (digital/analogue) computer systems are used to solve problems in field theory. He was concerned with how to introduce young people to science and noted that 70% of the science output was done by 5% of the scientists.

Again, the schedule did not leave time for visits to classrooms or laboratories--particularly so since the institute was housed in several buildings.

RIGA WHOLESALE TRADE OFFICE OF CENTRAL UNION
AND LATVIAN UNION OF COOPERATIVE SOCIETIES

We met with R. I. Denisov, Director, and with G. Grivinsh, Chief of Computerization Techniques and MIS Department, State Planning Committee, Latvian SSR. This visit was not on the scheduled itinerary and was presented as a surprise.

Mr. Grivinsh discussed the function of the trade office and other business organs under the ministries as the improvement of the system of regional planning. They are creating complex systems of automated management. There is a main territorial computer center at the level of the Latvian Council of Ministers. There are also territorial computer centers for collective use and at the same level there are separate branches with their own computer centers. All link with the main center for information exchange and for solving complex problems. The central link is ACMP (corresponds to GOSPLAN). One branch system is for trade, the split between urban and rural trade being about 50-50.

The Interindustry Institute of Training is involved and work is also being done at higher educational institutions as the University or Riga Polytechnical Institute. Each branch of industry has its own training system concerned with training of lower management. The emphasis is on existing managers more than young specialists.

Mr. Denisov described the Wholesale Trade Supply. About 2600 trade enterprises receive commodities from 2000 enterprises and firms. There is an assortment of 65,000 items (200,000 including the variations). The freight turn-over is 235,000 tons (time period unknown). There are 800 people on the staff. Ten percent have higher education or specialized secondary education. Only 47 have no secondary education.

The application of computers started in 1967. To date, they are dealing with training of the management staff. At the beginning there was no training institute for trade and people were sent to Riga State University for refresher courses. Almost all managers have undergone refresher courses including the director. In-house courses are given on psychology, cybernetics, etc. A particular problem was the lack of training in MIS (AMS) for TRADE. All staff members receive orientation.

As a result, they are devising methods as well as basic materials. It was noted that the methods do have some faults. Not enough attention is given to research because the methods are governed by the empirical approach. There is some gain in speed with less bureaucracy. One of the problems solved was that of the automation of presentation of data.

We visited display rooms and the computer center. We were told the facilities included 180,000 square meters and 18 kilometers of corridors. The display rooms were neatly arranged rooms of articles produced in the Soviet Union. We saw only a few rooms including glassware, sporting goods, musical instruments, clothing. We understand that not all articles were on display--some were in catalogues. We were told buyers would come in during mornings and make selections. (Our visit was in the afternoon and we saw few people that appeared to be outsiders during the visit.) Data was captured on teletypewriter-like devices so as to be readily put in machine-readable form.

The computer center appeared to be one of the most efficiently operated centers visited in the U.S.S.R. The facilities consisted of a Minsk 22 and 32. They hoped to acquire an ES 1035 (or possibly an ES 1032). (There models of the ES series appear to be more advanced versions of the original production models.)

We also received some descriptive materials on the Riga Wholesale Trade Office (appended to this report).

INSTITUTE FOR MANAGEMENT OF THE NATIONAL ECONOMY

We met with the following:

- V. G. Shorin - Rector
- L. I. Strelnikov - Pro-rector
- A. P. Polezhayev - Professor
- A. S. Roshchin - Professor
- V. S. Bobintsev - Associate Professor

Shorin provided an overview (the Computer Applications Working Group has previously met with Shorin in July 1973). The institute is organized to provide a well-established system of management training. The U.S.S.R. has had a system of improvement of qualifications at lower and mid-levels of management for some time. The Institute for Management of the National Economy is directed by Ministers and Deputy Ministers from both Republic and All Union Ministries, Chiefs of Main Departments and Directors of the larger enterprises and is under the organizational control of the State Committee for Science and Technology.

The curriculum is three months in duration. Trainees already have a candidate or doctorate degree. There are four main topic areas in the curriculum:

Gvishiani - Principals of economic development and how it applies to socialist economics.

Glushkov - Use of mathematical methods and models at level of national economy, ministries and enterprises

Lornov (Director of Institute of Psychology of the Academy of Sciences) - Social and psychological aspects of management.

Fedorenko - Use of automated information systems in management and decision-making.

Shorin made the following comments: National planning is needed; the market cannot solve everything. Still they are not always happy with the State Planning Committee.

A new facility for the institute is under construction in southwestern Moscow including the school, a computer center and hotel.

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Experience thus far has established the desirability of other similar institutes in the Republics, and there are now similar institutes in Kiev, Minsk and Central Asia which make use of the methods and curriculum at Shorin's institute.

In the program, each trainee receives 70 books and other materials. The class week runs 5 1/2 days. Lectures are given in the morning and seminars and labs are given in the afternoon. All trainees work with the computer for four hours per day, four times per week. There are no examinations, but each trainee prepares a graduate essay (project). The projects are implemented, and the applications are followed up with reports on the results from the ministry once a year.

Shorin indicated they are pleased with their work in the institute for the most part. Titles of some of the books that are used included the following: (We were given copies of these books which were edited by Shorin.):

- Actual Problems of Management
- Economical and Mathematical Methods and Models of Planning and Management
- Automated Systems of Management
- Introduction to Automated Systems of Management
- Problems of the Management of Science During the Scientific-Technical Revolution
- Legal and Social-Psychological Aspects of Management
- Systems Analysis and Management Structure

About 40,000-50,000 copies were printed of most of the books.

There is a small permanent teaching staff, individuals who are good teachers and program administrators, not necessarily famous researchers and scholars. That permanent staff apparently concentrates on research and methodology. The other instructors who teach come from research institutes and industry.

The kind of trainees vary somewhat from session to session; the number of trainees at a time depends on the course. The present building will accommodate no more than 80 students. (Programs appear to average about 12 weeks in duration.) The new building will accommodate 300-500 trainees at a given session and will also include living accommodations. Once every five years people will be invited back.

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By way of example, we were told about the schedule for the preceding week which included instruction on the following topics:

Introduction to Economics

Probability and Statistical Methods

Optimum Functions of National Economy

Problems of Improvement of Economic Mechanisms

Psychology of Labor

Introduction to Decision-making

Shorin's view on business games was that they were possibly useful as an analytic technique. Trainees, however, should think in terms of problems and should not be given "pills." He felt also that the construction of games was expensive--on the order of \$100,000-150,000. In regard to the case method, he was not very enthusiastic and characterized the method as "static."

An example was given of a trainee project that was carried out at the end of 1972. The problem, a Ministry problem, was one of placing optimum orders--and to do so without additional investment. The problem was solved with the help of trainees and staff; the application of the solution resulted in 833,000 rubles profit and first year and 1,200,000 rubles the following year.

Six major centers are affiliated with the institute

- Main Computer Center of GOSPLAN
- Research Computer Center of Academy of Science
- Central Economical Mathematics Institute
- Center for All-Union Research Institute for Management Problems
- Institute of Management
- (not available)

(Shorin commented that a principal feature of the next U.S.S.R. five-year plan will be "quality.")

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Shorin suggested a possible joint project that would involve a small working group of 3-5 people from each country. The group would attempt to develop recommendations for organization of management in enterprises from the viewpoint of high level managers and would assess possibilities in each country. Case studies might be used. Shorin felt that the analysis and conclusions might well be of use to the Soviet side.

We received a collection of a half dozen books on lectures given at the institute; we expect to receive other materials later.

ZIL AUTOMOBILE FACTORY

Soviet Participants Included:

V. V. Kalinin - Deputy General Director

A. P. Lizo - Rector, ZIL Technical Institute

V. N. Mosin - Chairman of Department, ZIL Technical Institute

M. N. Churaryov - Deputy Chief, External Relations Department

The major product is trucks. The factory (then only a small workshop) was founded in 1916 by brothers who were well known capitalists in Tzarist Russia. After the October revolution, the Soviet government decided to build a factory; on November 7, 1924, the first 10 automobiles were produced.

There are presently 100,000 employees. The factory has the latest production equipment and makes extensive use of conveyor systems. The factory is nearly self-contained in that it makes all parts except glass, lights, and electrical components. Even tools are made within the factory. Therefore a large technical staff is needed.

ZIL has its own technical school which provides eight years of instruction (8000 students). The first three years correspond to secondary education. (They provide secondary education for those who come without it.) Students are workers and graduates stay with the factory. The institute was established following a request to the government in 1960. There is also a management school with a three-year course.

A student's studies are closely related to work at the factory. In the fourth or fifth year, students work as engineers.

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The lowest level of student is foreman. Managers assume positions while undergoing training. There are about 75 part-time students per year in the management school and about 100-200 total over three years. The object, incidentally, is to meet only the managerial needs of ZIL operation.

In the industry, 20,000-25,000 go to refresher courses annually. The continuing education system is based on a five-year cycle, and every engineer is expected to go through retraining. Trainees visit other factories and also must read much literature in their field. In addition, there are special courses and individual training for special jobs: seminars of two-week duration are held for the purpose of describing the latest developments.

Production managers take a three-year program which meets three or four times a week. Courses include problems of labor and Soviet law, economic development of large factories, and organization and planning of machine building factories.

The computer center is largely concerned with administrative problems such as material and technical supply, inventories and payroll. Apparently, it plays little role in the training program. They have a Minsk and an Olivetti computer. There is little automation in the production lines.

We visited the truck assembly line--a single line perhaps 100 meters in length. It was moving at a reasonable pace but probably slower than comparable installations in the West. Part of it was automated through overhead conveyor belts that supply parts. At the last station, the completed truck would be started and driven away. There was a particularly large holding area for repair of defective trucks.

We received some descriptive literature on the trucks produced.

INSTITUTE OF USA AND CANADA STUDIES ACADEMY OF SCIENCES

We met with Boris Z. Milnor, Head of the Management System Department within the Economics Division of the institute, and a research fellow in Milnor's department. Milnor is also a half-time professor at Moscow State University. He has also taught at Shorin's institute. The institute was established in 1968 as the Institute of USA. Canada was added in 1974. Its purpose with reference to the U.S. is to study U.S. foreign policy to improve understanding of relations as well as to study the internal policies and ideology of the U.S. In the Economics Division there are two departments--one on economic development under Ivanov and one on management systems under Milnor. There are 300 scholars at the institute and 20 in Milnor's department.

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There are two section in the Management Systems Department:

- 1) Methodological problems of management
- 2) Organizational forms of management

In addition, there are special goal-oriented teams (task forces). Yerenka (also at the Plekhanov Institute of National Economy) and Rappaport were two specialists assisting in this work. There is a study group of two people in the computer field and one or two people working on psychological problems. There is a small group working on the organizational forms of using the computer. (Kotchelkov, who was in the U.S. about a year ago is in this group.)

The scientific directions of the Department were described as

- 1) Organizational forms and structures
 - trends in corporations, government, and other fields
- 2) Methodology
 - operations research, programming, forecasting
- 3) Problems of management information systems
 - problems related to industry
- 4) Human problems of management
 - personnel policies, behavior
- 5) Management of nation-wide problems (started last year)
 - studied TVA (with IIASA)

(Milnor is also associated with the Large Organizations Project (LOP) at IIASA.)

The outputs of the institute are books and journals. Examples included a book on the Kama River project (the organizational system was initiated at the institute) and another on the Ural electrical project (Kamensk) from the organizational viewpoint. They have also published a book on the Organizational Structure of Management in Industry and another one on the theory and implementation of organizational design. They have published 14 books related to different topics of management in the U.S. and U.S.S.R. as well as other books on special topics. A book of some 60 cases was also mentioned. (They want to publish 300 cases.)

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They have had contacts with the International Management Center (?) in New York and SIMCA/CIMCA (?) in New York City and Dayton, Ohio.

Milnor mentioned a management terms glossary project with Richard Cyert of Carnegie-Mellon University with the encouragement of the Ford Foundation which apparently was not successful (26 terms were compared). Currently, Milnor is working with Warren Cannon of McKinsey Consulting (New York City) on a similar project. There has been an exchange of vocabulary but no complete results thus far.

Milnor mentioned that Arjay Miller (Ford Motor Co.--now Dean of the GSB at Stanford) was at the institute for two weeks in May; James Hayes of the American Management Association gave two weeks of lectures about two years ago. Roy Ash was also there.

CENTRAL ECONOMIC MATHEMATICAL INSTITUTE

Soviet Participants:

- A. A. Modin - Deputy Director and Soviet Coordinator of Topic 1 (Econometric Modeling)
- B. P. Suvorov - Laboratory Chief
- V. M. Ioffe - Senior Scientist
- M. A. Bermant - (Management Systems)
- B. M. Zherebin - (Software and Support)

The meeting was brief and was, in part, a courtesy call on Modin, Suvorov and Ioffe who had just returned from meetings in the U.S. two weeks before in connection with project activities on Topic 1 (Econometric Modeling).

Zherebin has been proposed by Modin as the sub-topic chairman for software and support under the program in econometric modeling. Zherebin described some of his efforts in this regard.

With reference to Topic 5, Bermant described some of his interests. He has been concerned with scientific manpower management for socialist countries--the forecasting of scientific manpower needs, the number of people needed with candidate degrees, etc. The demand analysis depends in large measure on the academic degree although other factors are brought in where research and development is involved, for example, ratio of technicians to specialists and levels of specialists. Forecasting is made for periods of 5, 10 and 15 years. Two topics of special interest to

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Berment were the analysis and synthesis of organizational structures and the maximization of efficiency of utilization of scientific personnel. He clearly understood computerized management information systems in Western terms and had thought about how those ideas could be applied to the work he was interested in.

LIST OF APPENDICES

- APPENDIX 1 - Personal Trip Report by J. E. Austin
- APPENDIX 2 - Prospectus on Selected Programs of Management Training
Institute of Ministry of Consumer Goods in Tallinn
- APPENDIX 3 - Brochure of Riga Wholesale Trade Office of Central
Union and Latvian Union of Cooperative Societies
- APPENDIX 4 - Partial Listing (annotated) of Materials Received by
Delegation
- APPENDIX 5 - Record of Meetings of U.S. and Soviet Coordinators and
Experts on Topic 5

HARVARD UNIVERSITY
GRADUATE SCHOOL OF BUSINESS ADMINISTRATION
GEORGE F. BAKER FOUNDATION

JOHN E. AUSTIN
Lecturer on Business
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October 3, 1975

SOLDIERS FIELD
BOSTON, MASSACHUSETTS 02163

TRIP REPORT

Delegation to USSR on Topic 5 of the program of Cooperation in the Application
of Computers to Management, September 18 - October 1, 1975.

This is a personal report which assumes an overall knowledge of the program and a specific knowledge of the protocol for Topic 5 signed in Moscow on September 30, 1975. This protocol gives a record of the places visited and the people met, as well as a description of the sub-topics and forms of cooperation and specific activities.

An Overview of the Management Education

The major theme of this visit to the Soviet Union was an overview of management education. We were exposed to basic training institutions, such as the Training Institute in Tallinn, the Riga Interindustry Institute and the Zil Institute where there was a close relationship between requirements of on-going jobs and the individual course of studies being pursued. We visited teaching institutions which provided a five-year program of theoretical and practical studies to students of similar age and aspirations to our undergraduates in Colleges of Business Administration. These institutions included the Moscow Institute of Management, the Leningrad Institute of Finance and Economics, the Tallinn Polytechnic Institute, and the Riga Polytechnic Institute. At a third level we visited institutions with management education programs embedded in research environments such as those at Moscow State University and the Plekhanov Institute of National Economy. At the highest level of management education is the program for ministerial level executives at the Institute of Management of the National Economy in Moscow.

The programs at the enterprise level seemed to concentrate on two types of training: skills and techniques that could be rapidly applied to enable a supervisor or department head to do a better job. At the same time the trainee was exposed to theoretical material in socialist economy, the scientific organization of labor, Soviet law as it applies to labor and management, the psychology and physiology of work organization and an introduction to computers. The young supervisor has had several years of experience as a production worker before reaching

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the first level of management. Thereafter he may pursue a several year program of half-time work and half-time training as he is screened for possible higher advancement. An important feature of this training as the student nears the end of the program is the diploma essay. This begins with a problem statement taken from his work assignment which is approved by his advisor. The student works out a solution to this problem and presents it in both written and oral form to a committee composed of both academic lecturers and representatives from management of his work place. If the essay is accepted it is then implemented at his work place with a later follow-up by the committee to assess the results.

The programs at the institutions specializing in management training appeared to put more emphasis on the theoretical studies mentioned above, with stresses on economic planning, forecasting and evaluation technique. The curricular varied, but there were opportunities for periods of experience and the preparation of a diploma essay was stressed. These middle level management training institutions were also involved with contract work with local ministries and enterprises of either a consulting or an R & D nature. This work appeared to involve student diploma essays and a small amount of faculty research. The make-up of the student body at these institutions included both young men and women with some institutions having a female majority. We heard the comment in several places that the women students were more dedicated to academic work. These institutions appeared to have a comprehensive set of activities, including athletics, music groups, clubs, etc. Some were large with as many as 15,000 students that included full-time, evening and correspondence participants.

The management education at the university level seemed to be done on a smaller scale and in the context of Faculties of Economics. One of the obvious differences was that the management students were surrounded by other post-graduates pursuing doctorates and professors who were doing research and publishing. At this level there also seemed to be more interaction with practicing managers at the middle and high levels, with occasional conferences and seminars. Many of the faculty members at these institutions had multiple appointments at several places where they sat on essay committees and gave lectures. There also seemed to be a certain amount of interaction with ministries and such institutions as IASA in Vienna. The management curricular contained the same general elements cited above with, perhaps, a higher mathematical and analytical concentration. All management students were being exposed to computer-based problems although on this visit it was not possible to tell how sophisticated those problems were. The books and other materials we obtained at all levels should provide some detailed answers.

The Institute of Management of the National Economy of Rector Shorin appears to be unique in that it is under the State Committee for Science and Technology rather than the Ministry of Higher Education, it has four distinguished leaders in its chairs and it draws its students from the highest levels of Soviet organization. The students spend three months in full-time study at the Institute and are given a personal management library of 70 books which they may keep. The program stresses

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the problems of economic planning at the national level and combines many methods of instruction with a final essay project. This institute is relatively new, will soon move to a new building southwest of the center of Moscow, and appears to have as its mission the enhancement of the leadership capabilities at the top level in accordance with the Tenth Five-Year Plan's emphasis on quality.

Perspective on Management Needs

Opportunities to assess what the Soviet leaders feel their needs to be in management education were limited. Most of our discussions were an explanation of the developments to date. The opportunities provided by Topic 5 for the Soviet participants seemed to include the obvious chance to see and compare the US experience with their own; to understand and put-to-use teaching methods that are more fully developed in the US; and to gain access to technology for analysis and model-building that is not available to them. As an outsider on a brief visit I would guess that one of their important needs will be to train a new breed of specialists and managers who understand both the capabilities and management implications of advanced production and information processing systems that they are delivering from both internal and external sources. One example is the problem imposed by the now increasing installation of the Riad series computers (ES models 1020, 1022, 1030 and 1040). These are designed after the IBM System/360 computers of the 1960's with capabilities for multi-programming and time sharing on a scale previously not found in the USSR. Wide-spread use of these systems will require system programmers, specialists in management information systems, data base development and the like.

Perspective on Management Education Methods

From what we saw and heard, I would say that the lecture with supporting reading assignments is still the prevailing mode of instruction. Although we heard impressive descriptions of the Business Games (to be called Collective Decision Games hereafter) at the Leningrad Institute and some experiments with the Case Method at the Plekhanov Institute, and saw a teaching laboratory for structured discussions at the Riga Polytechnic Institute, by and large our visits to these institutions revealed a number of lecture amphitheaters and seminar rooms. The question asked of us revealed an interest in both the content and methods of management education in the US, and an unexpressed envy in what they supposed our level of teaching resources to be. Our group was impressed with both the desire and the level of their effort to bring about constructive change, and often with the quality as well. Discovering their needs in the area of teaching methods will have to be an exploratory process to a great extent because their ability to absorb a technique such as the Case Method will depend on many social and organizational factors. One of their strengths that they can offer to us is their practice of combining the practical with the theoretical through contract research and the diploma essay. The close affiliation that exist between ministries, industries and educational institutions would be well worth our study.

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Aspects of Cooperation on Topic 5

In the final stages of negotiation on the protocol, it became clear that the Soviet side has the following desires and needs:

1. They would like to travel in the US and see how we live and do things.
2. They would like the increased status that such travel and cooperative activity brings in the USSR.
3. They would like some good publications to their credit which would increase their professional visibility both in their own country and the world.

Speaking personally, I would stress the desire to learn more about all aspects of the management process in the USSR in order to bring about a more friendly, co-operative and understanding relationship between the two countries that, at the moment, hold most of the cards in the world game. I also feel that there are some aspects of planning that can provide food for thought for us as we move into an era requiring a greater stewardship of resources and a closer attention to environmental needs. I think there may be some lessons in the Soviet experience of large-scale planning that we can learn from.

For these reasons, I would stress the following forms of cooperation that are mentioned in the protocol:

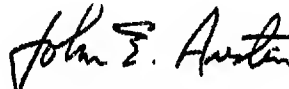
1. An active program of exchange of lectures. Having had the experience myself of visiting several Moscow institutes to give talks and hold seminars, I find it to be a most useful form of knowledge sharing and gathering, particularly if the visit can extend over days or weeks.
2. Joint projects, such as the experimental course proposed in Subtopic 3, in which US and Soviet specialists work on a new "product" together and then test it out in both countries with appropriate tailoring to fit the specific social and economic needs of the setting. Similar projects could be conducted in the areas of modelling and gaming.
3. Publications written and edited jointly for the purpose of producing new knowledge, not simply summarizing the past and the present. Although there is a certain amount of catching up to do for a development of a state of genuine understanding among us, this effort should move along as quickly as possible to the point where common

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efforts will be the main emphasis. It seemed to me that the Soviet experts we met were eager to work on those aspects of our profession that we can agree on and not dwell on differences.

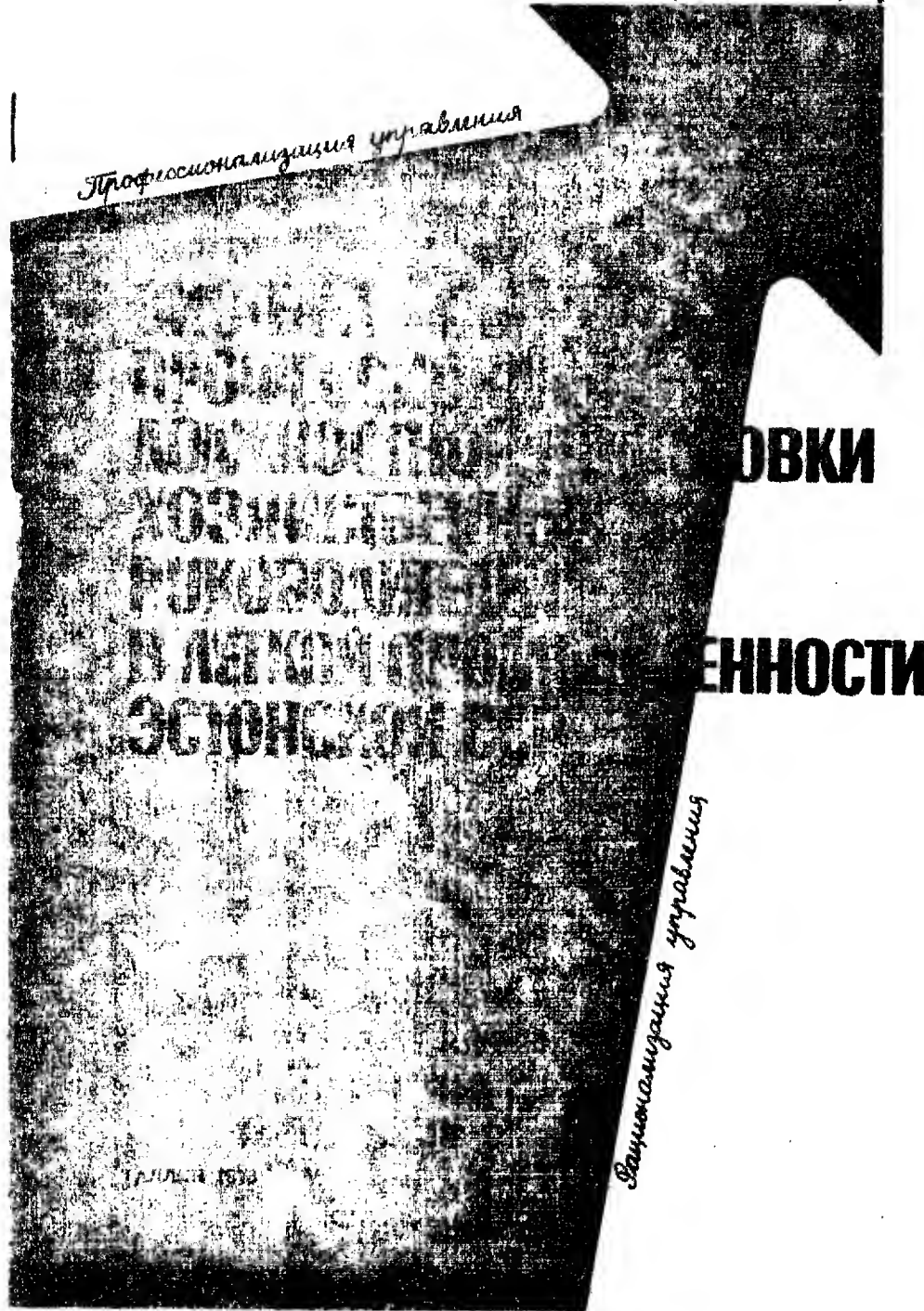
Finally, there is no adequate way to describe the outpouring of hospitality, friendship and support that was extended to us during these two weeks. It was unforgettable.



John E. Austin

ЦЕНТР НАУЧНОЙ ОРГАНИЗАЦИИ ТРУДА И УПРАВЛЕНИЯ
МИНИСТЕРСТВА ЛЕГКОЙ ПРОМЫШЛЕННОСТИ
ЭСТОНСКОЙ ССР • УЧЕБНЫЙ КОМБИНАТ
МИНИСТЕРСТВА ЛЕГКОЙ ПРОМЫШЛЕННОСТИ
ЭСТОНСКОЙ ССР

*Повышение
эффективности
управления и производства*



Проспект подготовлен канд.экон. наук Х.Кала,
Ю.Месилуу, Л.Саулин, Ю.Пярнитс, П.Сирге

В содружестве Центра научной организации труда и управления и Учебного комбината Министерства легкой промышленности Эстонской ССР найден и апробирован новый эффективный метод комплексной рационализации управления – профессионализация систем управления.

Новизна данного эксперимента заключается в сочетании двух органически связанных начал – формирования зрелого профессионального руководителя и совершенствования системы управления.

Центром НОТ и У МЛП ЭССР разработаны и довольно успешно применяются такие формы и методы совершенствования системы управления, в процессе которых формируется и сам хозяйственный руководитель (директор предприятия, его заместители, начальники цехов), и такая система подготовки руководящих кадров, в которой происходит совершенствование системы управления.

Опыт экспериментальной системы базовой подготовки первых групп профессиональных хозяйственных руководителей в системе МЛП ЭССР свидетельствует о ее высокой экономической и социальной эффективности, несколько раз превышающей эффект от внедрения новой техники, создания АСУ, НОТ и других факторов развития производства.

Экономический эффект от внедрения проектов рационализации управления, разработанных выпускниками первых экспериментальных курсов под руководством специалистов Центра НОТ и У превышает 3 млн. рублей.

В рамках эксперимента на предприятиях отрасли впервые разработаны такие сложные проблемы, как производственная и техническая стратегия предприятия до 1977 и 1980 годов, управление качеством и техническим прогрессом и др.

Успешно начали работать на своих новых, более ответственных постах выпускники курсов: директора предприятий Т.Вярва (фабрика им. 1 Декабря), К.Иохансоо (КОПО "Коммунар"), И.Карклиньш (Вильяндская льнопрядильная и ткацкая фабрика), начальники цехов Н.Синякова (отделочная фабрика комбината "Кренгольмская мануфактура"), Л.Рейсин (КОПО "Коммунар") и др.

ЦЕЛИ

СИСТЕМЫ ПРОФЕССИОНАЛЬНО-ДОЛЖНОСТНОЙ ПОДГОТОВКИ ХОЗЯЙСТВЕННЫХ РУКОВОДИТЕЛЕЙ В ЛЕГКОЙ ПРОМЫШЛЕННОСТИ ЭСТ. ССР

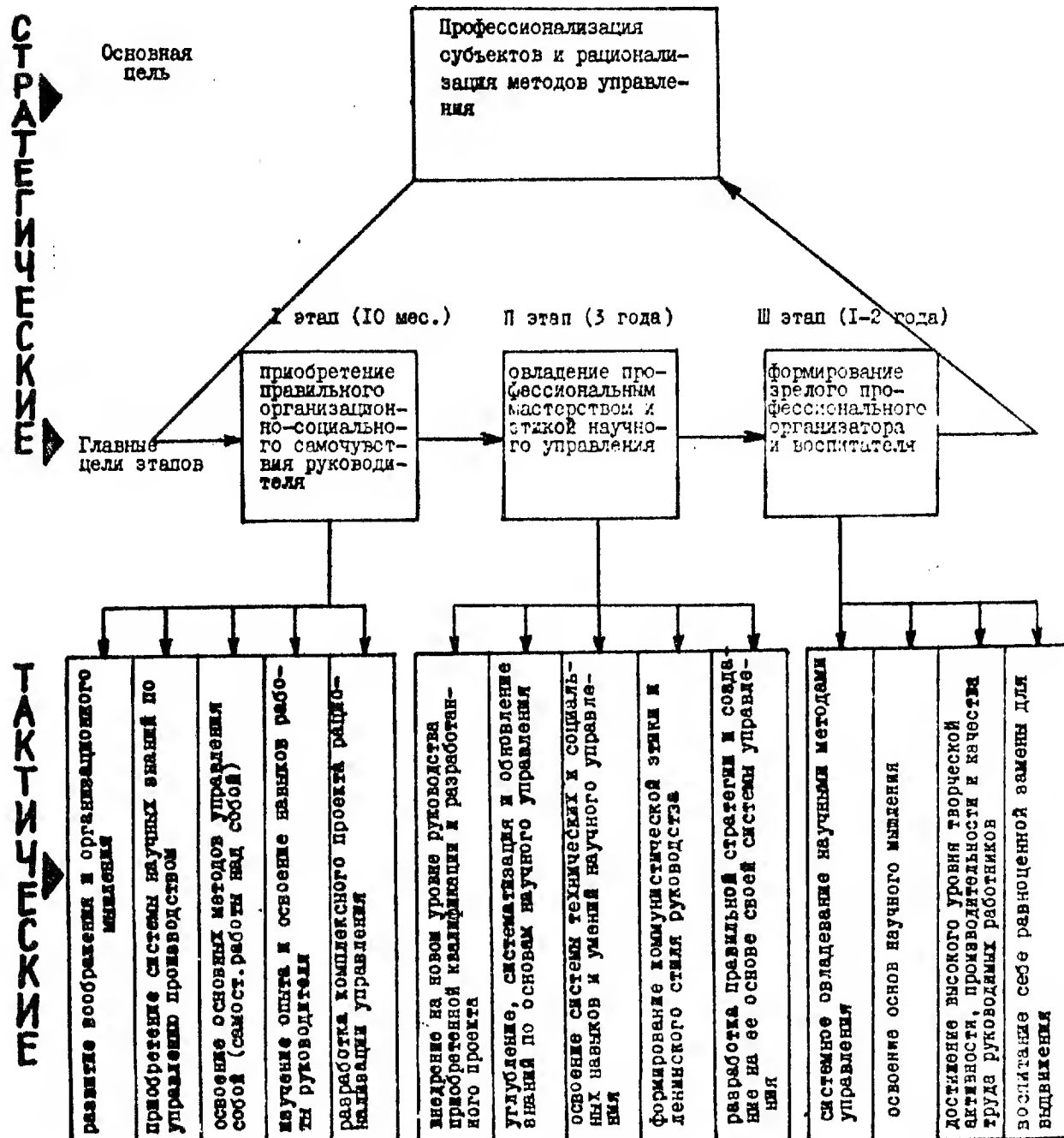
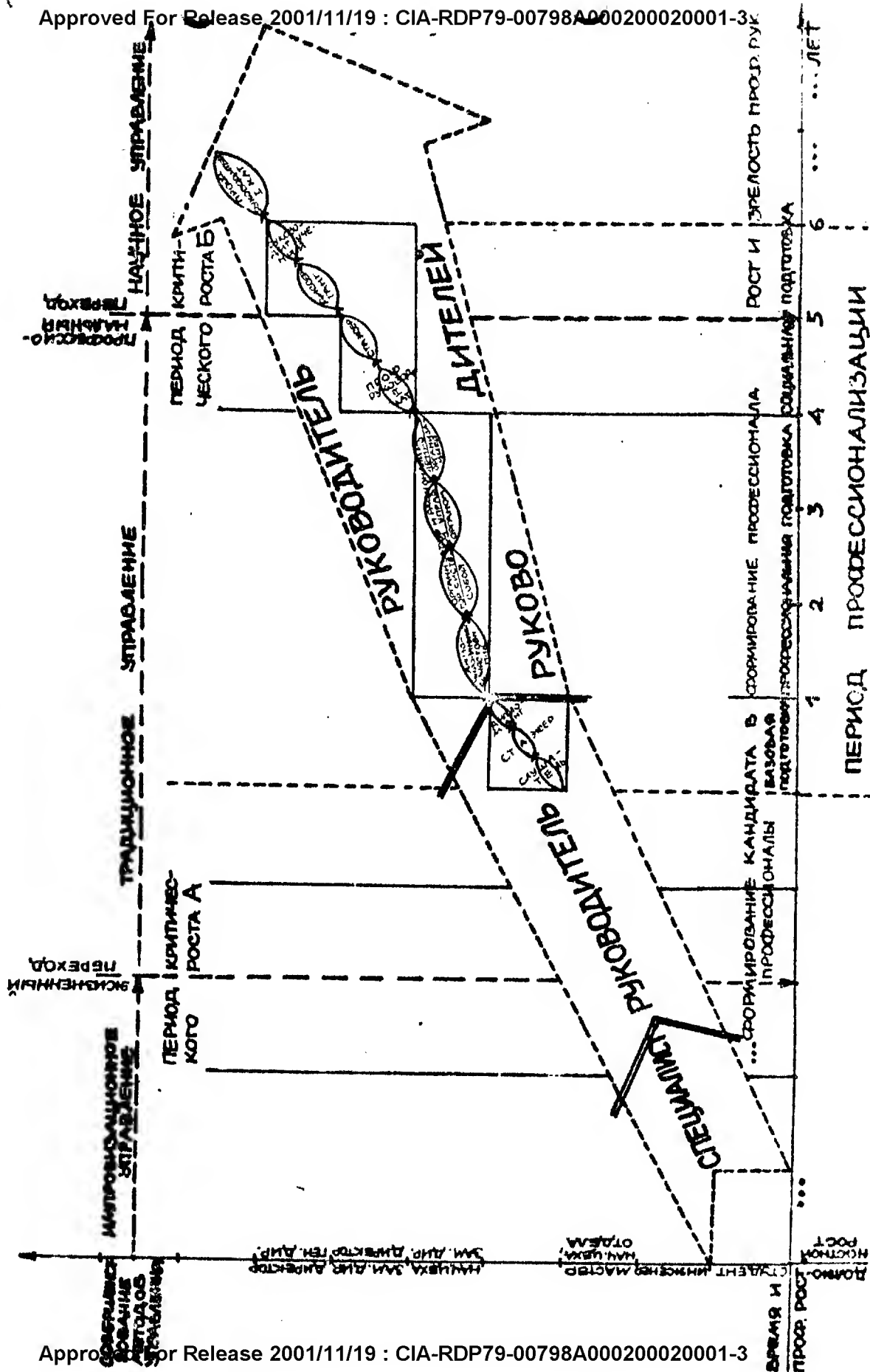


СХЕМА ФОРМИРОВАНИЯ И РОСТА
ПРОФЕССИОНАЛЬНЫХ ХОЗЯЙСТВЕННЫХ РУКОВОДИТЕЛЕЙ
В СИСТЕМЕ ЛЕГКОЙ ПРОМЫШЛЕННОСТИ ЭСТ. ССР



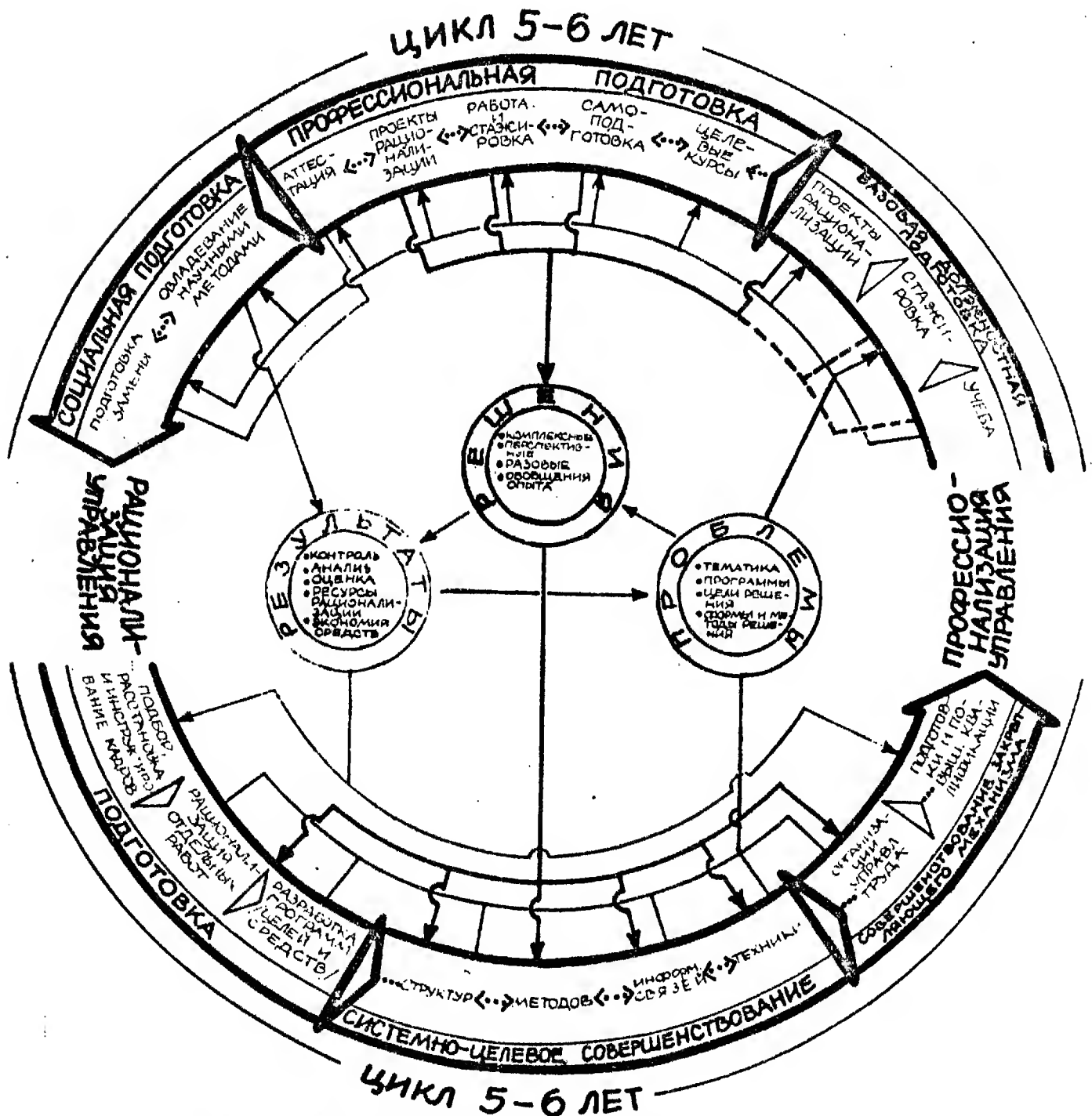
Утверждено на коллегии МЛП ЭССР
от 12 февраля 1971 год

КВАЛИФИКАЦИОННАЯ ХАРАКТЕРИСТИКА ПРОФЕССИОНАЛЬНЫХ ХОЗЯЙСТВЕННЫХ РУКОВОДИТЕЛЕЙ
В СИСТЕМЕ МИНИСТЕРСТВА ЛЕГКОЙ ПРОМЫШЛЕННОСТИ ЭСТОНСКОЙ ССР

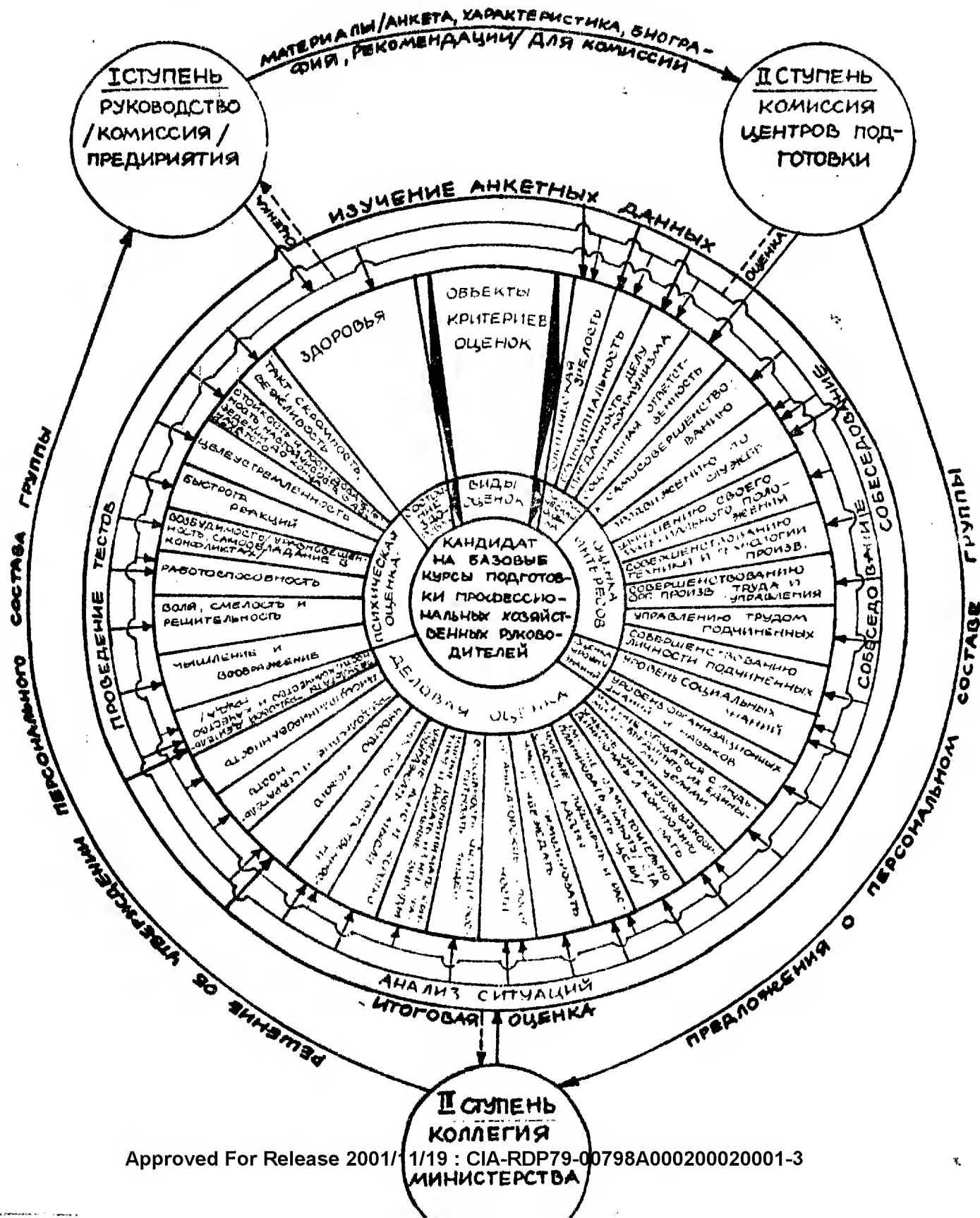
(в процессе базовой подготовки)

Квалификационные категории профессиональных хозяйственных руководителей	Квалификационные требования					Руководящие должности, подлежащие комплектованию профессиональных хозяйственных руководителей
	уровень специальных знаний	уровень организационных навыков (стаж работы на руководящих должностях)	уровень управленческих знаний	уровень профессионального мастерства	уровень научной подготовки	
1. Руководитель I категории	Высшее инженерное или экономическое	Не менее 5 лет	Кандидатский минимум по спец. 080005 "Экономика, организация управления и планирования народного хозяйства на "отлично" или "хорошо"	Стажировка на трех передовых предприятиях и защита многофакторного проекта на "отлично"	Кандидат наук по спец. 080005	Генеральный директор производств. объединения и его заместители
2. Руководитель II категории	Высшее инженерное или экономическое	Не менее 5 лет	Кандидатский минимум по спец. 080005 "Экономика, организация управления и планирования народного хозяйства"	Стажировка на двух передовых предприятиях и защита многофакторного организационного проекта	-	Директор предприятия и его заместители, главные специалисты предприятий
3. Руководитель III категории	Высшее	Не менее 3 лет	Комплексная программа "Научные основы управления производством" на "отлично" или "хорошо"	Стажировка на одном передовом предприятии и защита комплексного проекта рационализации управления на "отлично" и "хорошо"	-	Начальники производств, филиалов, фабрик, цехов и отделов центрального аппарата объединения (предприятия)
4. Руководитель IV категории	Высшее	Не менее 1 года	Комплексная программа "Научные основы управления производством"	Стажировка на одном передовом предприятии и защита комплексного проекта рационализации управления	-	Начальники цеха, отделения и приравненных к ним подразделений
5. Руководитель V категории	Среднее специальное	-	Программа "Научные основы управления производством"	Стажировка на одном передовом предприятии и защита проекта рационализации управления	-	Старший мастер, мастер

САМОРЕГУЛИРУЮЩИЙСЯ МЕХАНИЗМ ПРОФЕССИОНАЛИЗАЦИИ И РАЦИОНАЛИЗАЦИИ УПРАВ- ЛЕНИЯ В ЛЕГКОЙ ПРОМЫШЛЕННОСТИ ЭСТ. ССР



MODEЛЬ ПОДБОРА КАНДИДАТОВ НА



ПРОГРАММА ТЕОРЕТИЧЕСКОЙ БАЗОВОЙ ПОДГОТОВКИ ХОЗЯЙСТВЕННЫХ РУКОВОДИТЕЛЕЙ В СИСТЕМЕ ММП ЭСТ. ССР	
448 ЧАС.	200 ЧАС. ЛЕКЦИИ
	239 ЧАС. ПРАКТ. ЗАНЯТ.

НАУЧНЫЕ ОСНОВЫ УПРАВЛЕНИЯ ПРОИЗВОДСТВОМ	
244 ЧАС.	134 ЧАС. ЛЕКЦИИ
	110 ЧАС. ПРАКТ. ЗАНЯТ.

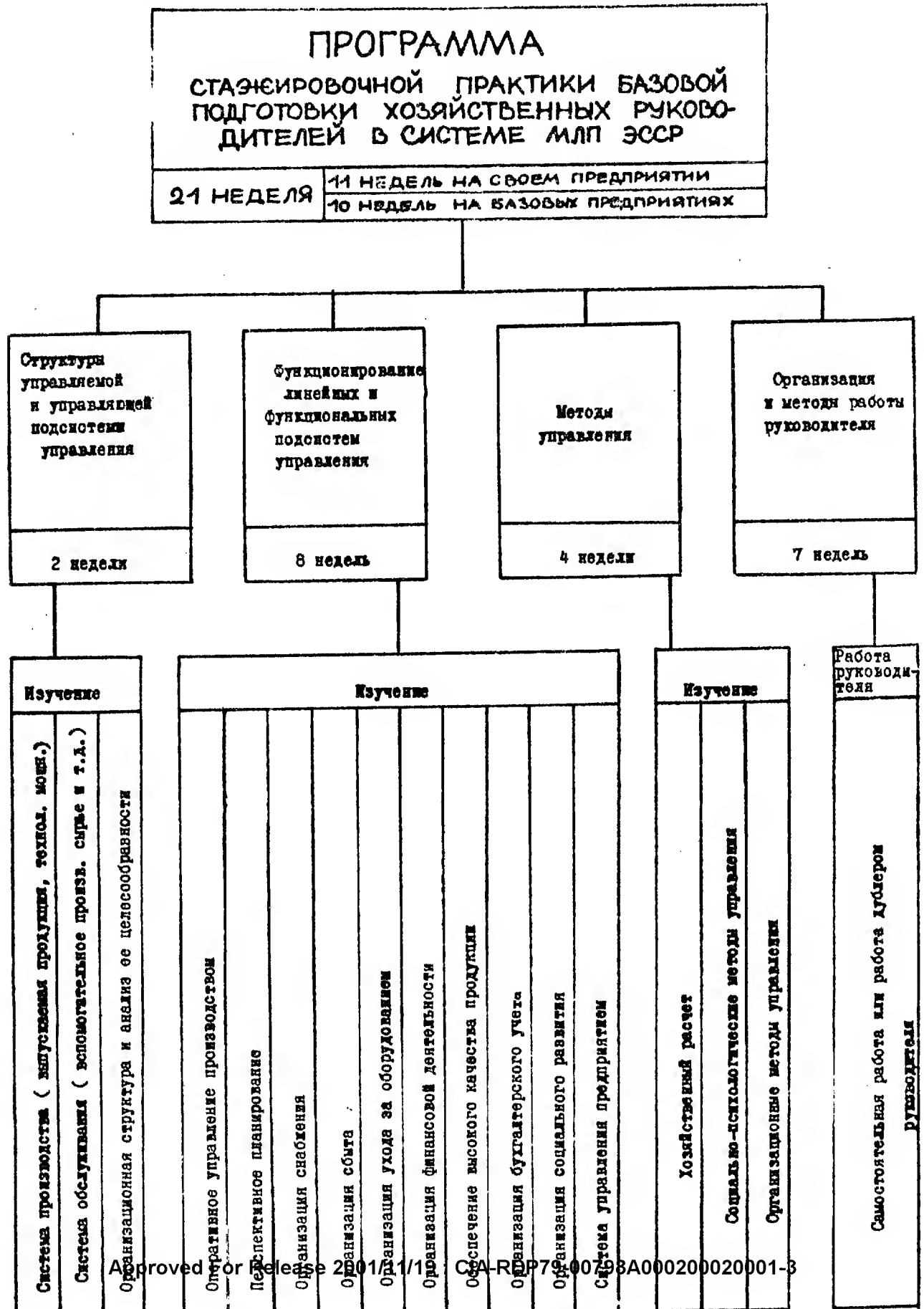
ЭКОНОМИКА, ОРГАНИЗАЦИЯ И ПЛАНИРОВАНИЕ ПРЕДПРИЯТИЙ ЛЕГКОЙ ПРОМЫШЛЕННОСТИ	
134 ЧАС.	73 ЧАС. ЛЕКЦИИ
	61 ЧАС. ПРАКТ. ЗАНЯТ.

ЧЕЛОВЕК, ТРУД И ТЕХНИКА В СОЦИАЛИСТИЧЕСКОМ ПРОИЗВОДСТВЕ	
70 ЧАС.	43 ЧАС. ЛЕКЦИИ
	27 ЧАС. ПРАКТ. ЗАНЯТ.

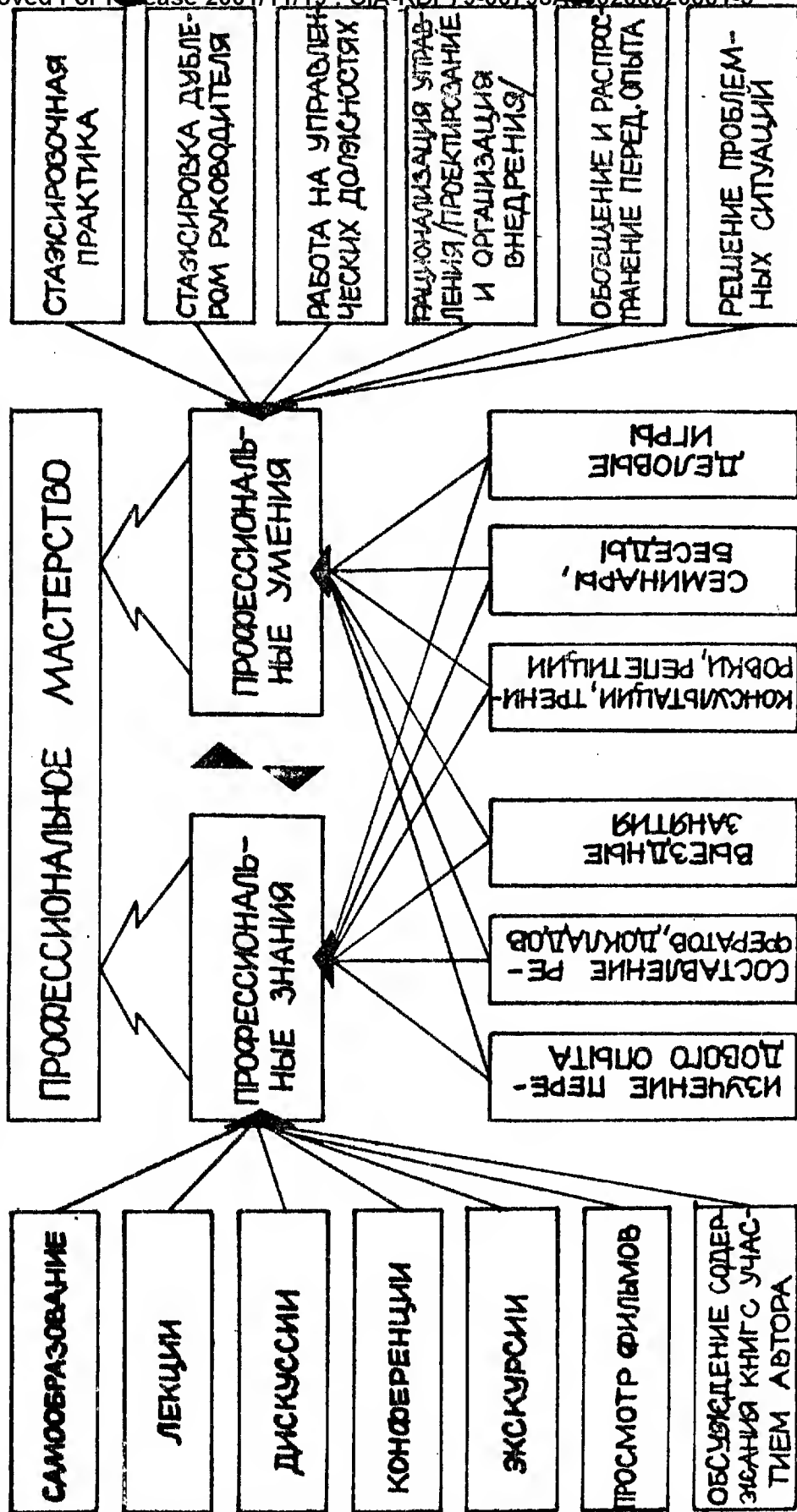
Современные проблемы управления
Сущность методологической основы управления
Организация управления производством
Методы управления социалистическим производством
Технология и техника управления
Кадры и культура управления
Научная организация управленческого труда
Стратегия и тактика совершенствования управления производством

Структура современного промышленного предприятия
Внутрипроизводственные резервы и методы их выявления
Техпромышленное предприятие и организация его разрабoтoк
Баланс хозяйственной деятельности предприятия и его анализ
Технический прогресс и совершенствование организации производства
Производственная программа и производственные мощности
Организация и планирование трудовых и материальных ресурсов предприятия
Финансы предприятия
Материально-техническое снабжение и сбыт продукции

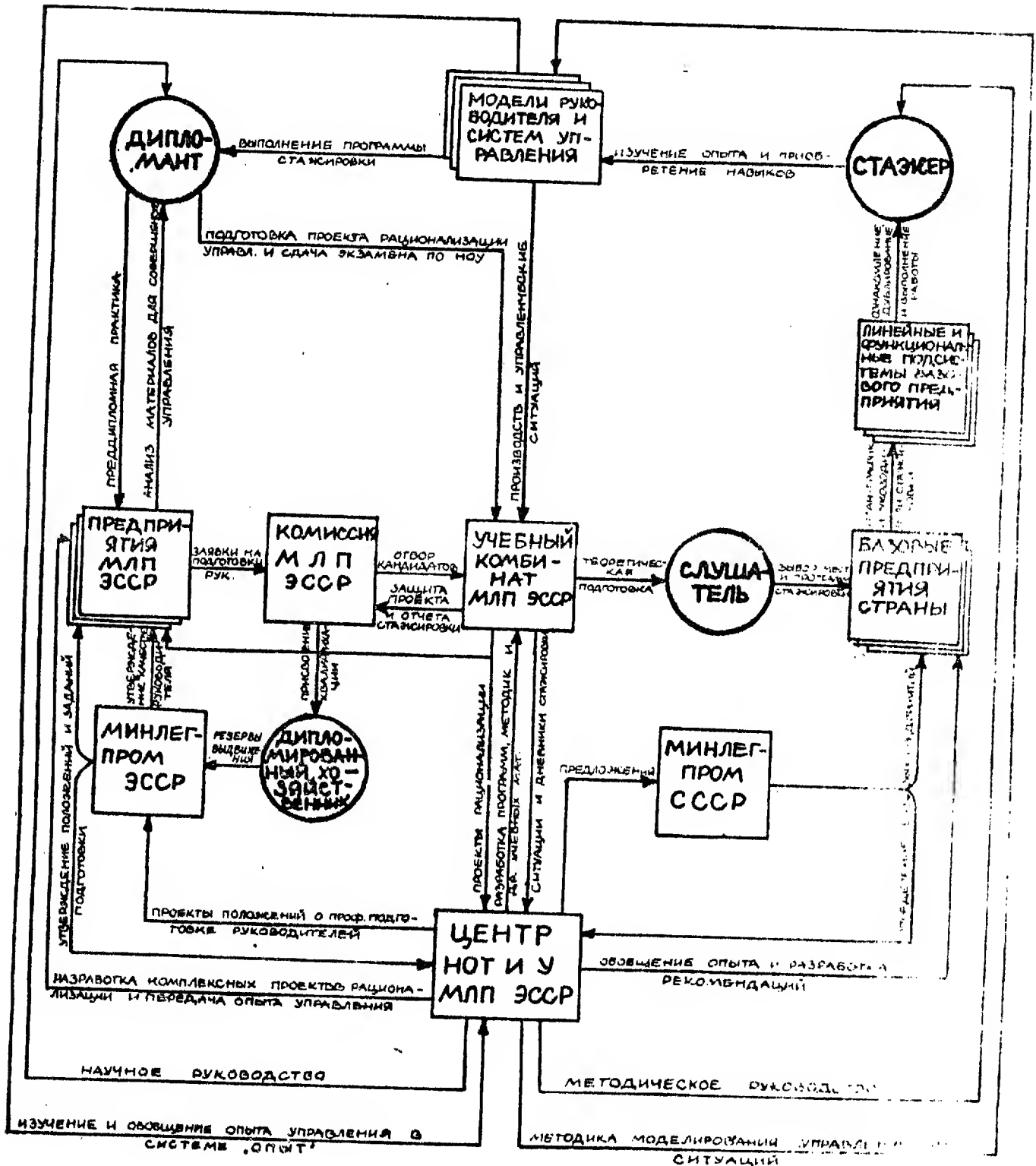
Человек и его работа в условиях современной научно-технической революции
Совершенствование производственных отношений в социалистическом производственном коллективе
Диалектика социального и технического прогресса
Основы социологии
Основы производственной психологии
Основы физиологии труда
Основы научной организации труда
Основы трудового и хозяйственного законодательства СССР
Основы техники безопасности



МЕТОДИКА ФОРМИРОВАНИЯ ПРОФЕССИОНАЛЬНОГО МАСТЕРСТВА ХОЗЯЙСТВЕННЫХ РУКОВОДИТЕЛЕЙ В СИСТЕМЕ ММП ЭССР

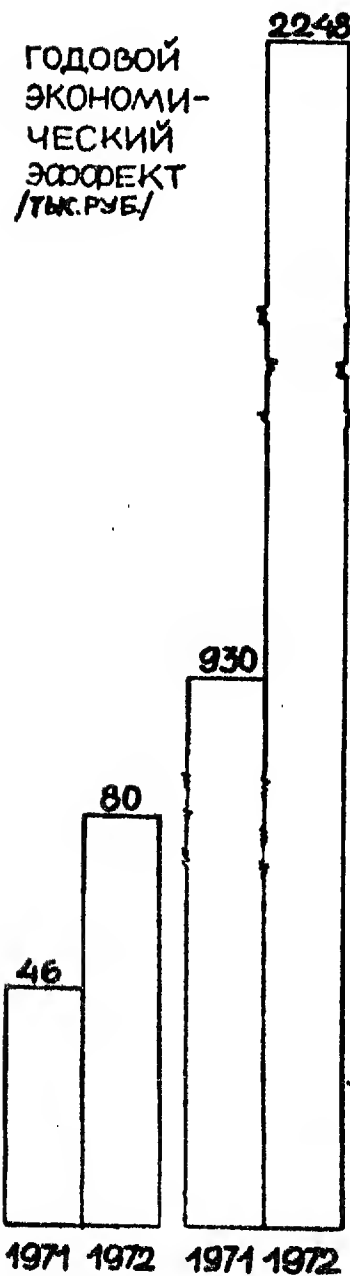


МОДЕЛЬ ОРГАНИЗАЦИИ БАЗОВОЙ ПОДГОТОВКИ ПРОФЕССИОНАЛЬНЫХ ХОЗЯЙСТ- ВЕННЫХ РУКОВОДИТЕЛЕЙ В СИСТЕМЕ МЛП ЭССР

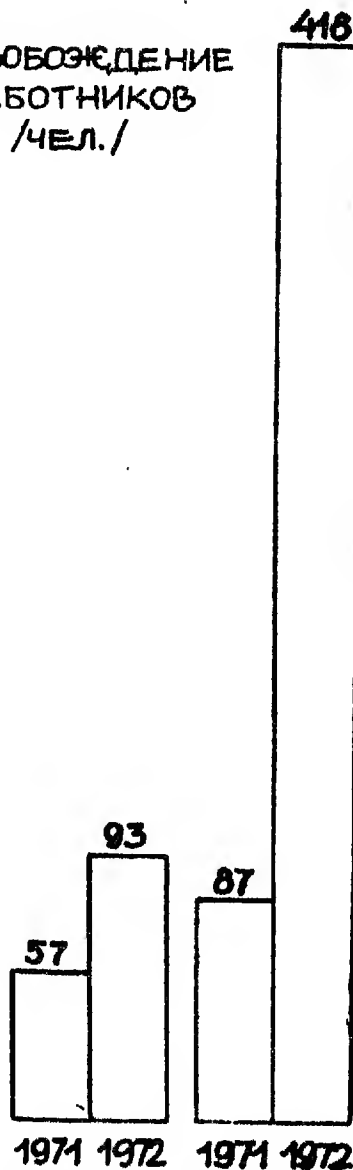


Approved For Release 2001/11/19 : CIA-RDP79-00798A000200020001-3

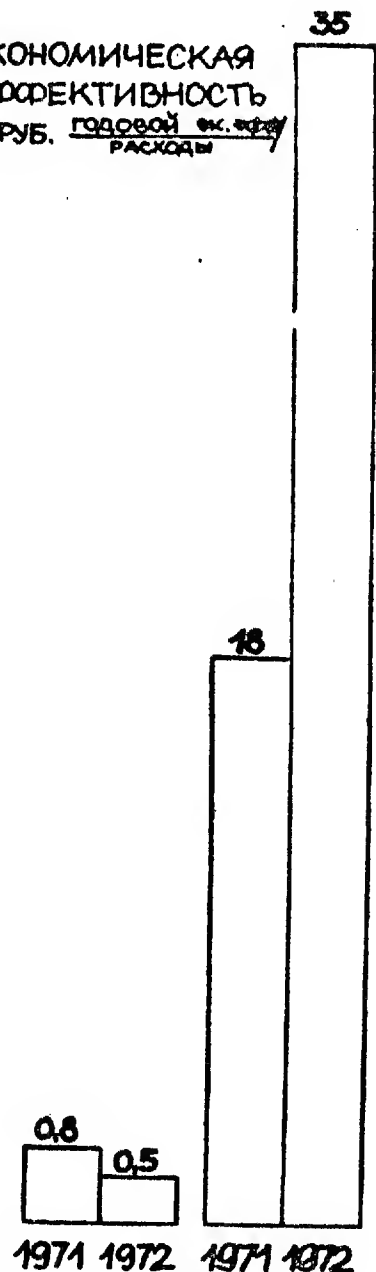
СРАВНИТЕЛЬНАЯ ЭКОНОМИЧЕСКАЯ ЭФФЕКТИВНОСТЬ ПРОЕКТОВ РАЦИОНАЛИЗАЦИИ УПРАВЛЕНИЯ ПРОФЕССИОНАЛЬНЫХ ХОЗЯЙСТВЕННЫХ РУКОВОДИТЕЛЕЙ, ВЫПОЛНЕННЫХ В СИСТЕМЕ МЛП ЭССР В 1971 И 1972 ГГ.



ВЫСВОБОЖДЕНИЕ РАБОТНИКОВ /ЧЕЛ./

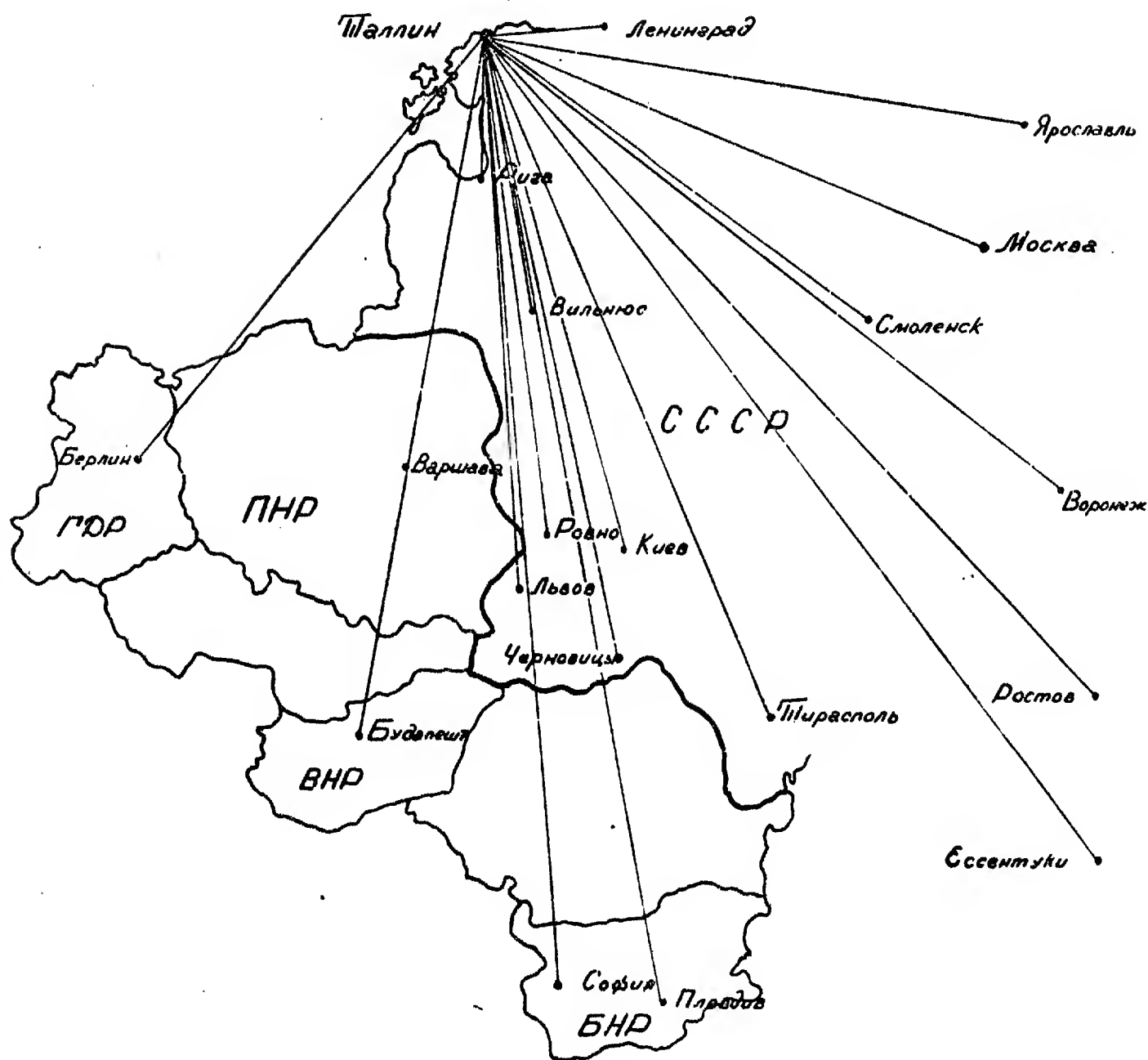


ЭКОНОМИЧЕСКАЯ ЭФФЕКТИВНОСТЬ /В РУБ. ГОДОВОЙ ЭК. ЭФФ. РАСХОДЫ



Экспериментальный комбинат "Бит"
Таллин, ул. Пикк, 68
Подписано в печать 25/У 1973 г. Тираж 2000 экз.
Бумага 30х41. Уч.-изд.л. 1,75.
МВ-06320. заказ № 1008-1056.

*Маршруты слушателей курсов базовой
подготовки профессиональных руководителей,
командируемых за пределы республики, для
стажировки и накопления опыта*

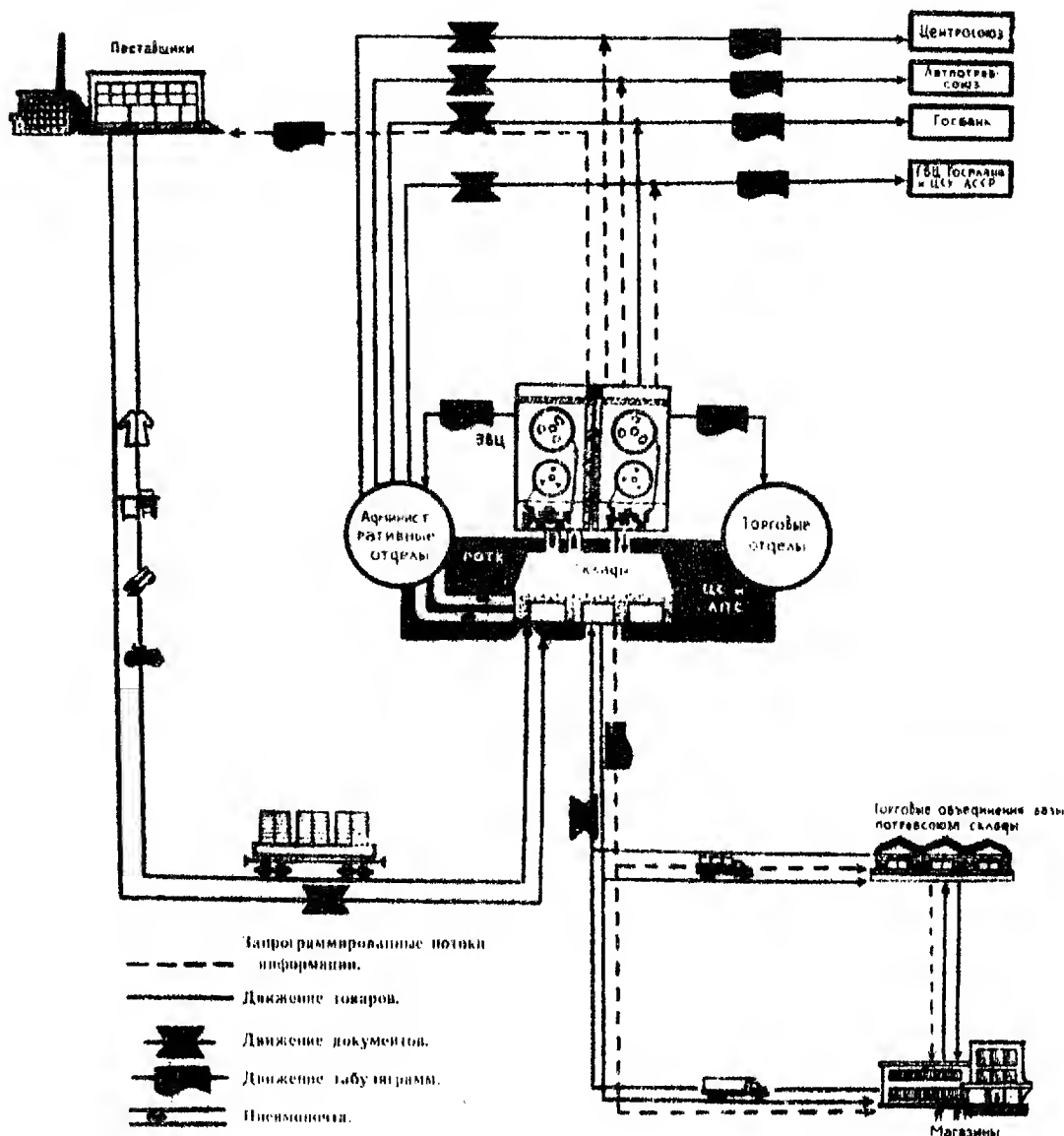




ЦЕНТРОСОЮЗ И ЛАТПОТРЕБСОЮЗ

РИЖСКАЯ ОПТОВО-ТОРГОВАЯ КОНТОРА

СХЕМА ИНФОРМАЦИОННЫХ ВЗАИМОСВЯЗЕЙ АВТОМАТИЗИРОВАННОЙ СИСТЕМЫ
 УПРАВЛЕНИЯ ПРОЦЕССАМИ ОПТОВОЙ ТОРГОВЛИ
 (АСУ ОПТ)





Рижская оптово-торговая контора Центросоюза и Латпотребсоюза является крупным, высокомеханизированным предприятием оптовой торговли союзно-республиканского подчинения системы потребительской кооперации. В соответствии с подчиненностью она выполняет двойные функции:

1. Межреспубликанскую оптовую торговлю с республиканскими, областными и межрайонными базами системы потребительской кооперации СССР всех союзных республик;

2. Поставку товаров районным базам, торговым объединениям, потреббществам и непосредственно магазинам системы Латпотребсоюза, расположенным в 21 из 28 районов Латвийской ССР.

Торговые операции осуществляют 10 торговых отделов, в подчинении которых находится 38 товарных складов.

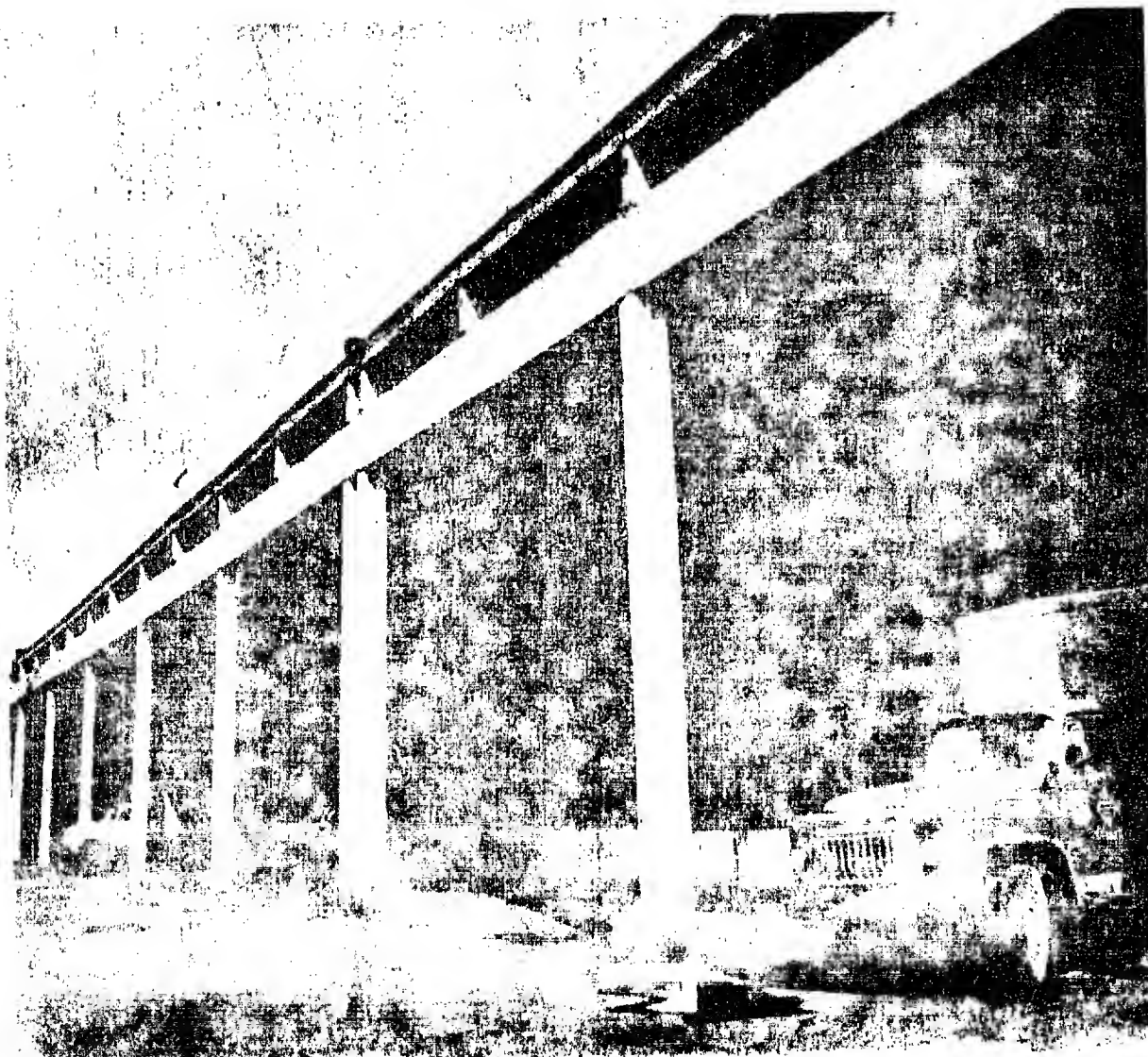
Для погрузки-разгрузки товаров из автомашин оборудованы две крытые рампы общей протяженностью около 500 м.

Железнодорожные вагоны разгружаются внутри здания на 2-х путях подъездным путем длиной 100 м.

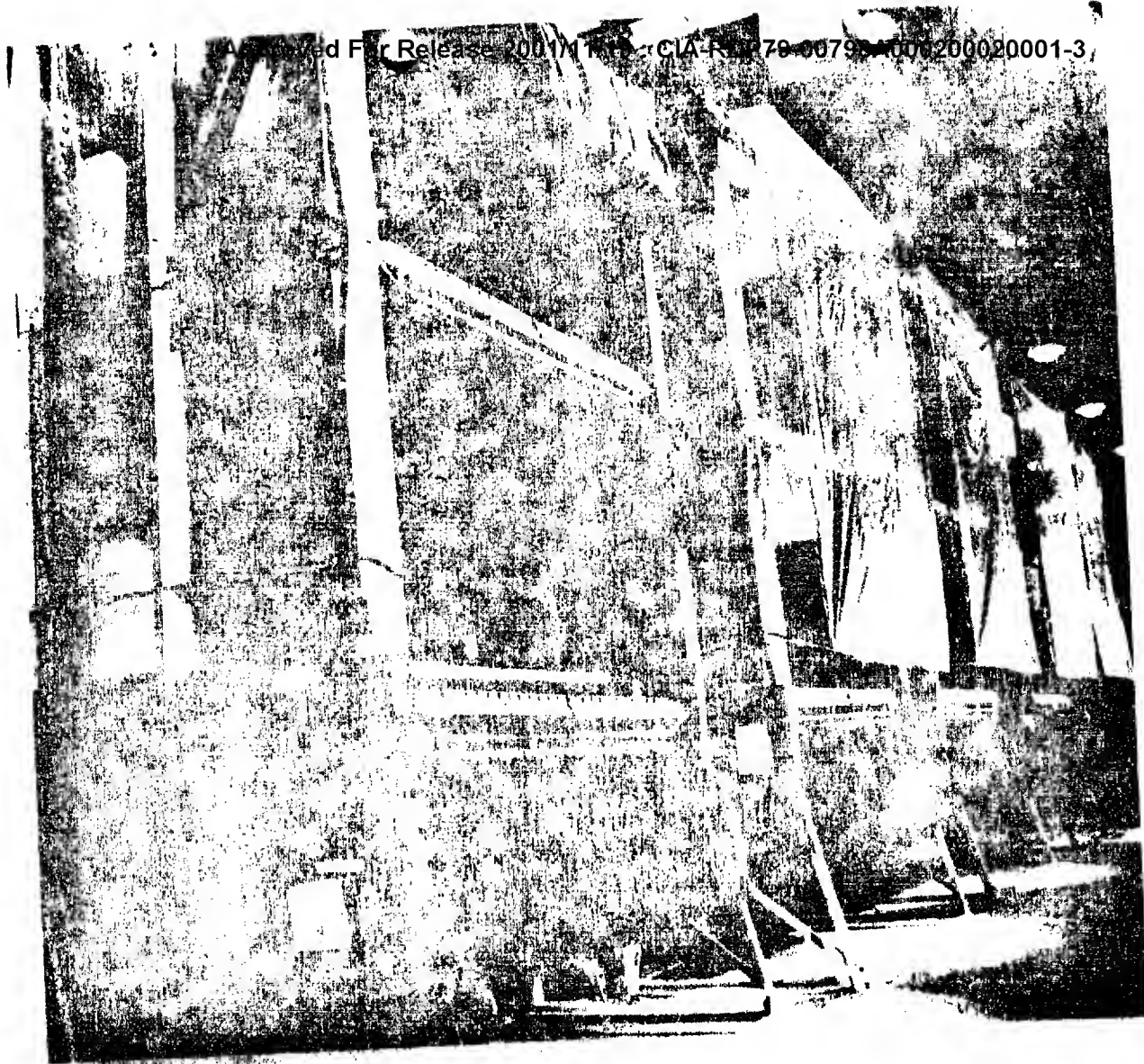
Ежедневно в работе используются:

вилочные погрузчики	— 30 шт.
электроштабелеры	— 30 „
электрокраны	— 3 „
автопогрузчики	— 2 „
мостовой кран 5,0 тн	— 1 „
эл. тележки 5,0 тн для перевозки контейнеров	— 2 „

Использование навального аккумуляторного электротранспорта, предварительное комплектование грузов по направлениям и хранение товаров на паллетах позволяет загрузить автомашину грузоподъемностью в 3 тн. за 7 мин., 4-х осный вагон за 1 час. 30 минут.



*BEST COPY
Available*



Которая предстала перед нами. Углубившись в историю, мы узнали, что
Отец основал этот город в 17-м веке.
Средневековые стены и башни, которые мы видели, были построены
Российскими войсками в 18-м веке, когда город был захвачен.
Наша работа в этом городе была связана с изучением истории и культуры
этого места.
Восстановление города началось в 19-м веке.
Сегодняшний город — это результат работы многих поколений.
Сейчас он — один из самых красивых городов в стране.
Восстановление города началось в 19-м веке, когда он был захвачен
1500 солдатом. В то время город был в очень плохом состоянии.
Сейчас он — один из самых красивых городов в стране.
РПЦК является центром культуры и искусства. В нем
есть много прекрасных картин и скульптур.

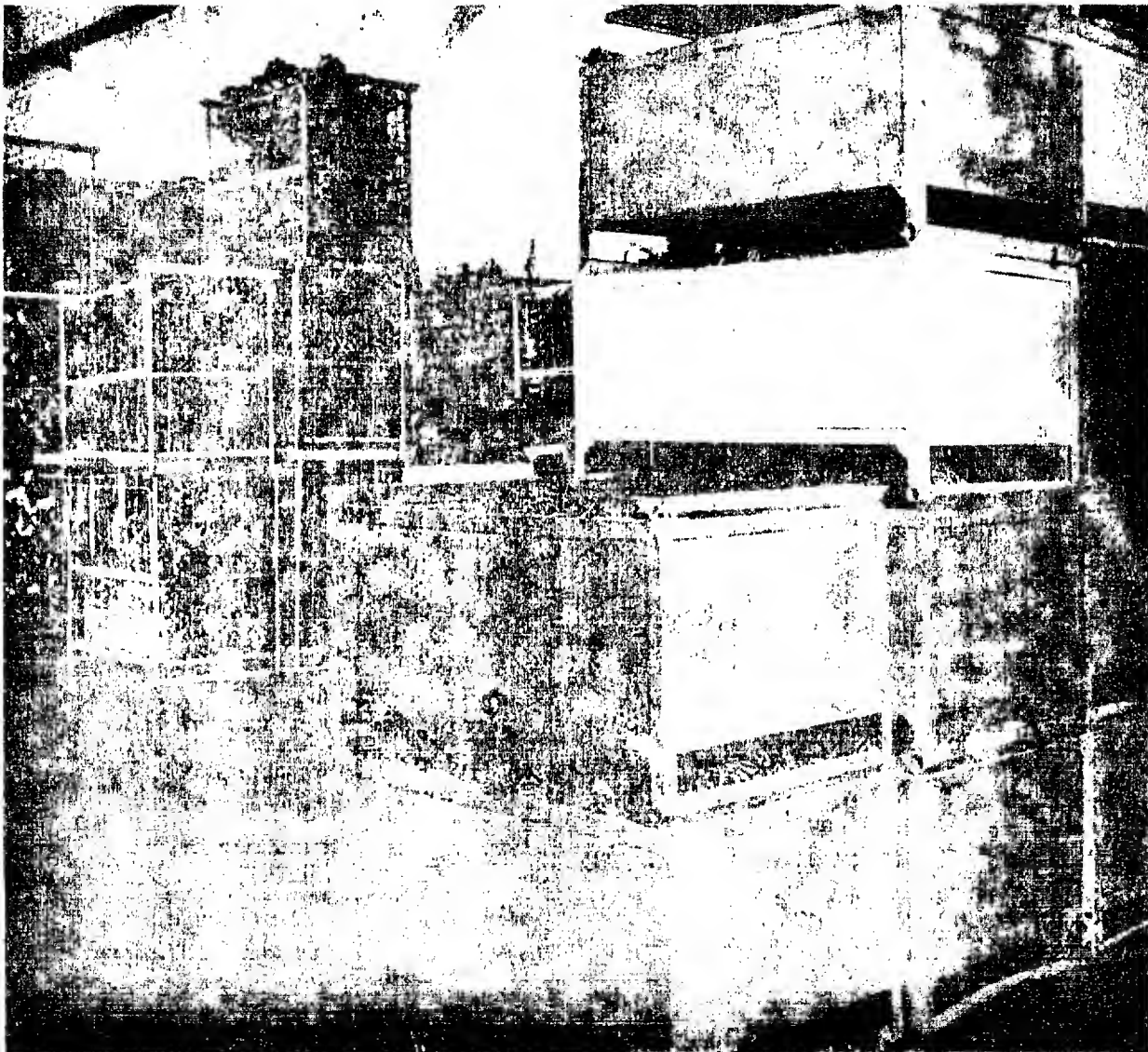
Для хранения верхней одежды используются механические вешала.
Высота загрузки товаров — до 6 м., длина одного вешала — 4,5 м.
Перемещение ярусов производится при помощи эл. мотора.

Для хранения товара удобны стоечные паллеты различной конструктивной модификации. Применение их позволяет рационально использовать складскую площадь.

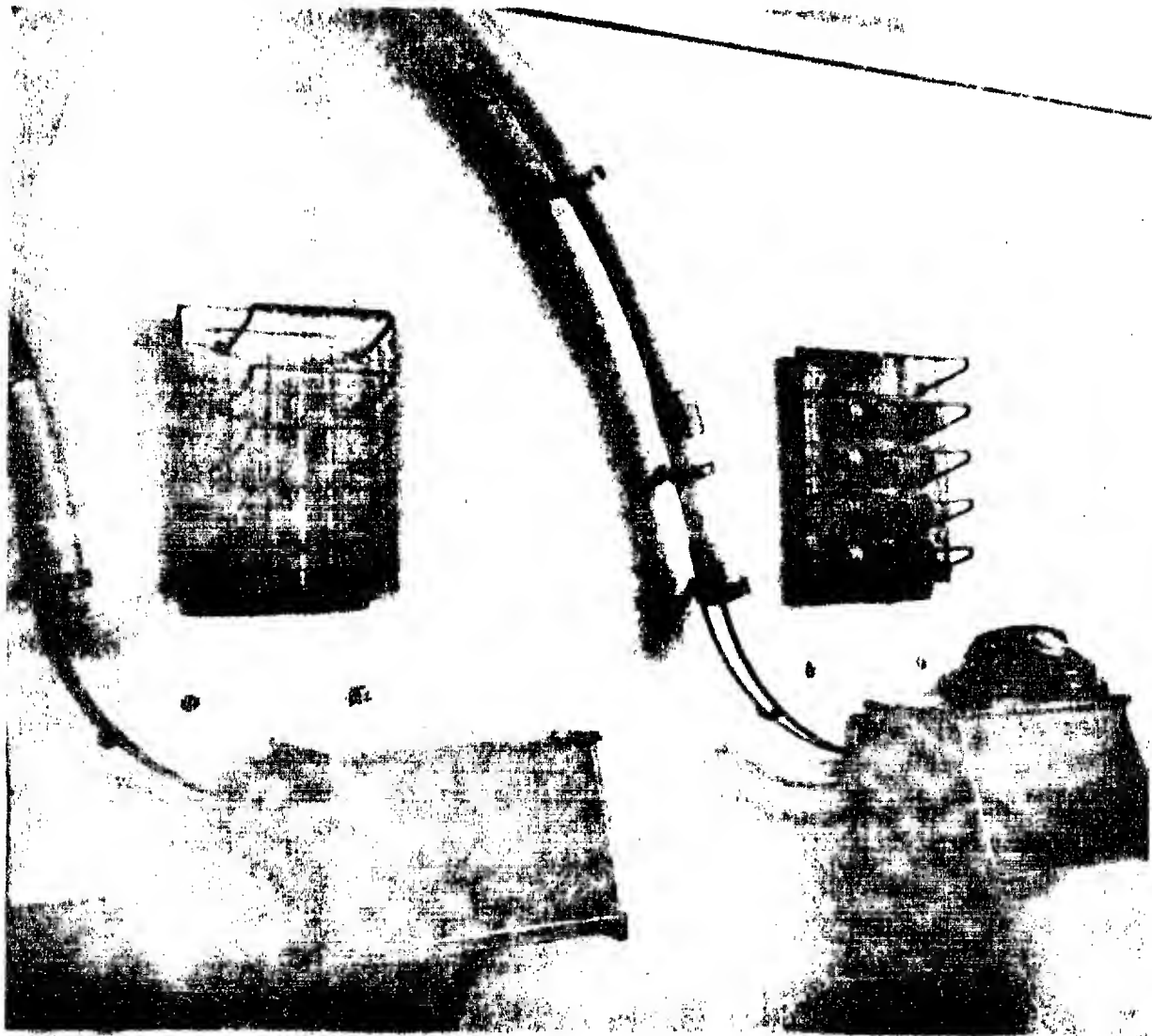
Для тяжеловесных товаров используются паллеты с закрытыми стенками. Емкость — 0,8 м³. Позволяет складирование до 5 ярусов.

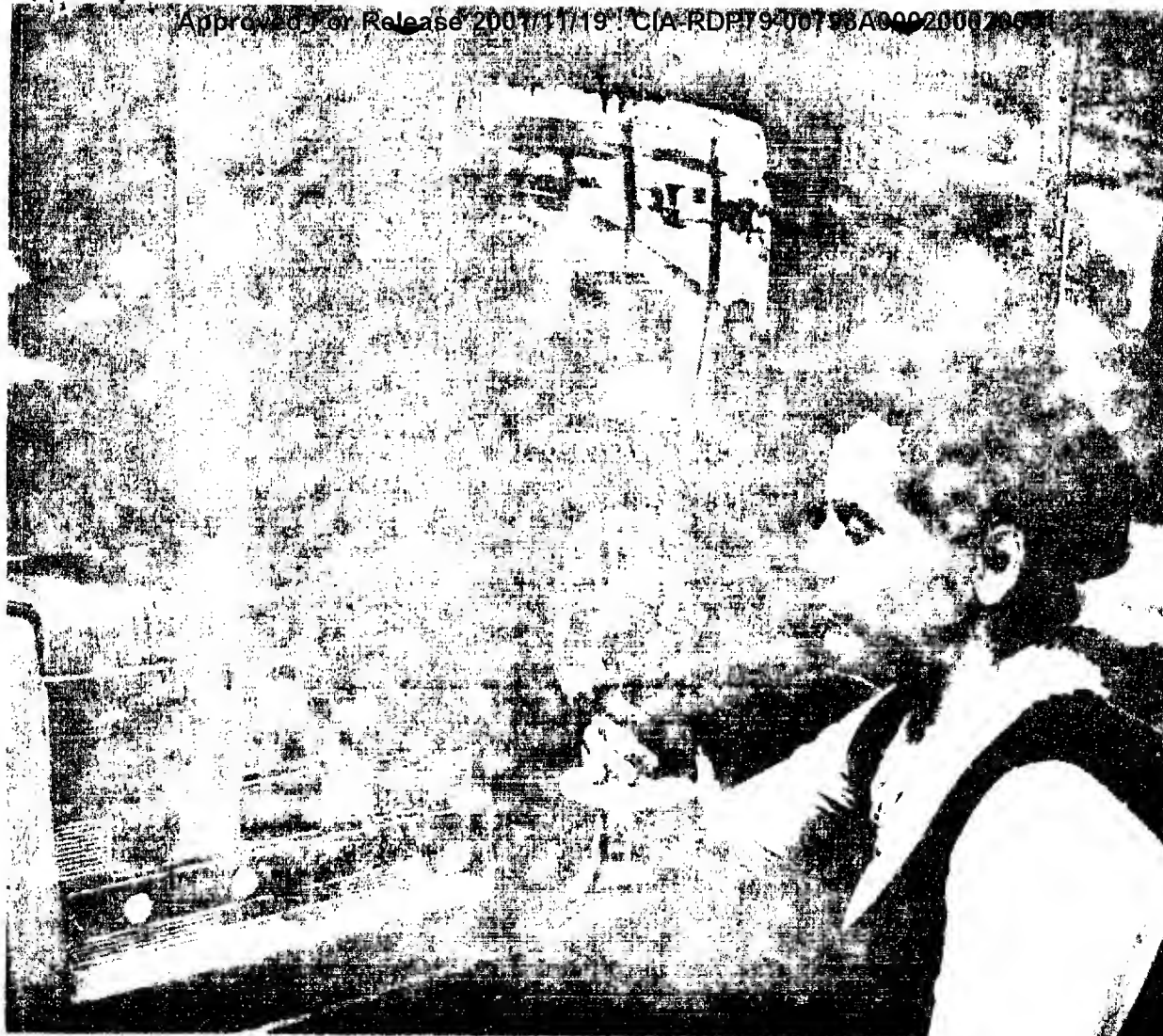
Для более легких и объемных товаров используются паллеты решетчатой конструкции, емкостью до 1 м³. Позволяет складирование до 4-х ярусов.

Для хранения телевизоров используются паллеты специальной конструкции. Вместо двух ярусов при обычном хранении — 8-ми ярусное штабелирование.



К концу 1972 года вступит в строй пневмопочта длиной 1800 метров на 21 приемно-отправочных станциях для пересылки оперативных документов между складами, товарными отделами и ЭВЦ.





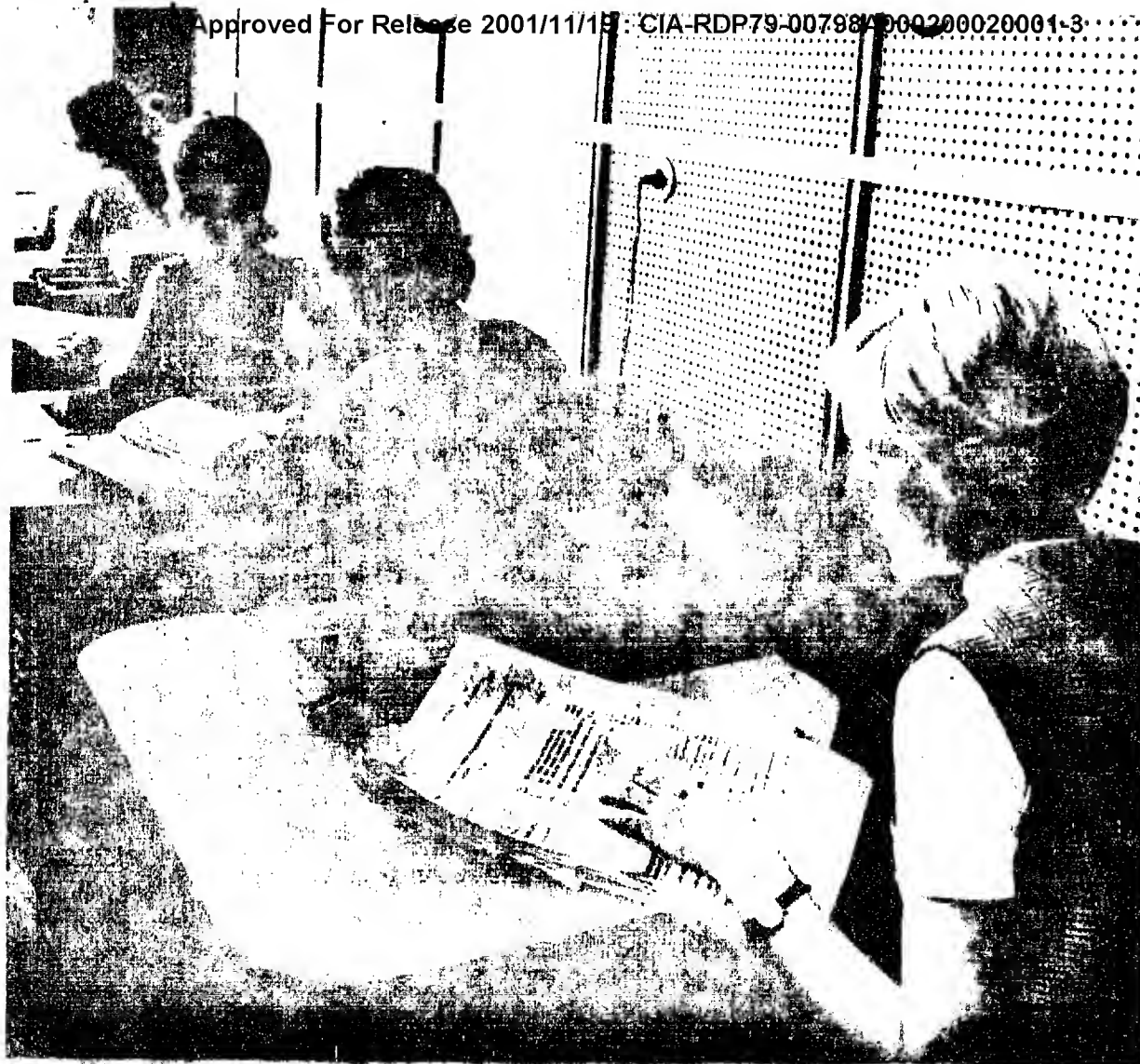
Процессы погрузо-разгрузочных работ и складирования товаров механизированы, контролируются установкой промышленного телевидения ПТУ-12 и управляются диспетчерами посредством громкоговорящей связи.



Для связи торговых отделов с вычислительным центром используются средства дистанционной передачи -- приема информации «Рута-001» и «Рута-002».

«Рута-001» считывает информацию с перфокарт-заготовок и клавиатуры, передает на устройство «Рута-002», которая принимает и регистрирует ее на перфолените.



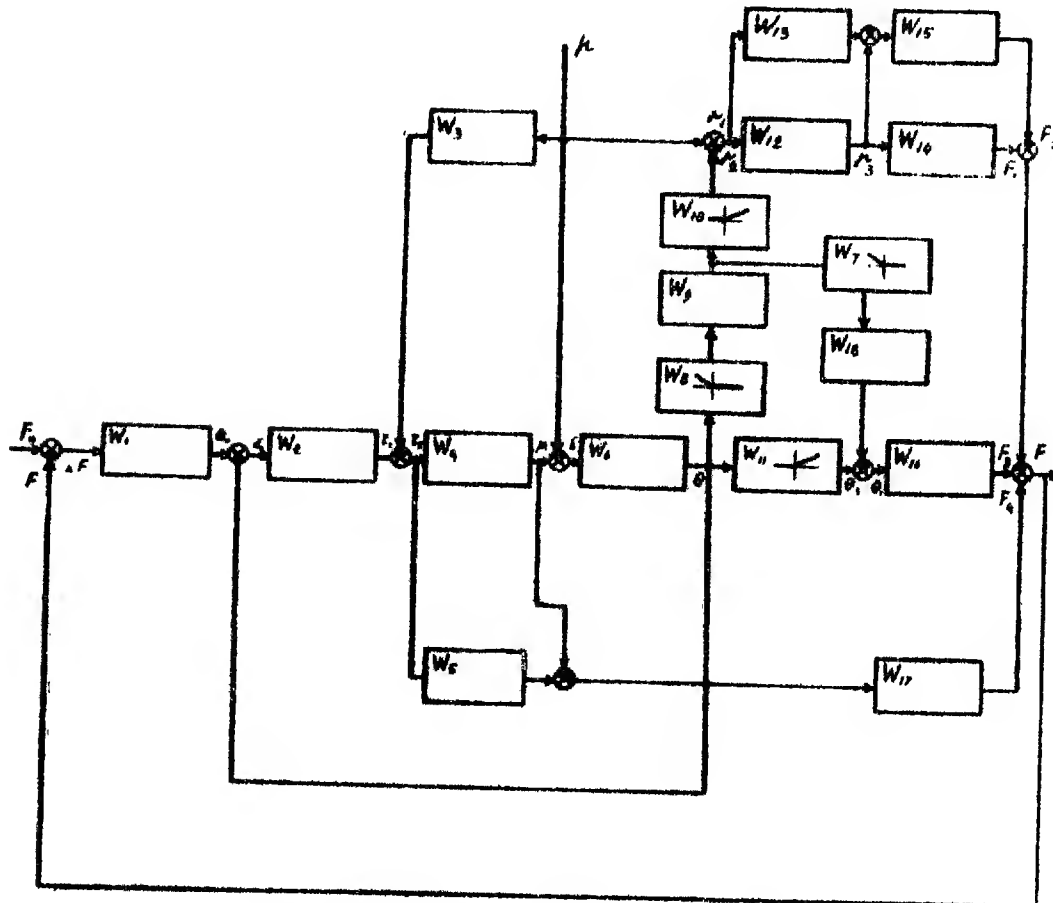


В условиях функционирования АСУ-ОПТ образовалась возможность сократить плановую численность работников конторы с 1125 человек в 1968 году до 852 человека в 1971 году, при росте товарооборота с 356 млн. руб. в 1969 году до 416 млн. руб. в 1971 году. Прибыль конторы за этот же период возросла с 825,0 тыс. руб. до 1571,0 тыс. руб.

Использование ЭВМ сократило сроки обработки информации, дало возможность решить качественно новые задачи, изменило характер труда в социально-психологических аспектах, которые косвенно влияют на общую эффективность эксплуатации АСУ-ОПТ.



МОДЕЛЬ УПРАВЛЕНИЯ ПРОЦЕССАМИ ОПТОВОЙ ТОРГОВЛИ АСУ—ОПТ



МОДЕЛЬ СИСТЕМЫ УПРАВЛЕНИЯ РОТК ОПИСЫВАЕТСЯ СЛЕДУЮЩИМИ УРАВНЕНИЯМИ:

$$\begin{aligned} E &= H_0 - H & (1) & \quad \gamma_1 = \gamma_1 + \gamma_2 & (4) & \quad H = \gamma W_0 & (7) \\ \gamma_1 &= E W_1 & (2) & \quad M = \gamma W_4 & (5) & \quad \Delta F = F_0 - F & (8) \\ \gamma_2 &= \gamma W_3 & (3) & \quad \hat{\gamma} = M - \gamma & (6) & \quad F = F_1 + F_2 + F_3 + F_4 + F_5 + F_6 + F_7 + F_8 + F_9 & (9) \end{aligned}$$

- W_1 — оператор финансового регулирования.
- W_2 — оператор формирования заказа в промышленности.
- W_3 — оператор прогнозирования спроса населения.
- W_4 — оператор выполнения заказа промышленностью.
- W_5 — оператор планового запоздывания выполнения заказов промышленностью.
- W_6 — оператор накопления отклонений интенсивности спроса поступления товаров.
- W_7, W_8 — нелинейные операторы, позволяющие формировать реальные процессы управления на РОТК.
- W_9 — оператор формирования неудовлетворенного спроса.
- W_{10} — оператор реализации спроса.
- W_{11} — оператор планового запоздывания реализации.
- W_{12}, W_{13} — функциональные операторы, обеспечивающие функционал эффективности РОТК.
- W_{14}, W_{15} — функциональные операторы, обеспечивающие функционал эффективности РОТК.
- W_{16}, W_{17} — функциональные операторы, обеспечивающие функционал эффективности РОТК.

- H_0 — оптимальный уровень запасов товаров.
- H — фактический уровень запасов товаров.
- E — отклонение H от H_0 .
- γ — интенсивность спроса (количество потребляемых изделий или товаров в единицу времени).
- γ_1 — интенсивность запаса в промышленности ИЗП.
- M — интенсивность поступления товаров на склад.
- γ_1 — ИЗП, формируемый на основе E .
- γ_2 — ИЗП, формируемый за счет информации о спросе γ .
- $\hat{\gamma}$ — отклонение интенсивностей спроса и поступления товаров на склад.
- F_0 — заданное значение функционала эффективности ФЭ.
- ΔF — отклонение функционала.
- \oplus — точки управления системой.

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Бесценно

Upravlenie Sotialisticheskim Proizvodstvom: Voprosy Teorii I Praktiki

V. G. Afanas'ev; D.M. Gvishiani; V.M. Lisitsyn; G. Kh. Popov; Editors-
THE MANAGEMENT OF SOCIALIST INDUSTRY: QUESTIONS OF THEORY AND PRACTICE: Second
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In the book, on the basis of recent achievements of Science and practice, questions of the management of socialist industry are thoroughly brought to light. The structure of the book has been improved in the second edition. New chapters are introduced which are devoted to questions of territorial management, management in the non-industrial sector, etc. A series of chapters are supplemented with new material;

The book is prepared in co-operation with the textbook program for the higher rank of the economic education system. It is meant for directors of the cadres of ministries, departments, districts and regional organs of management, directors of associations and enterprises.

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SShA: Podgotovka Rukovodiashchego Personala Promyshlennykh Korporatsii.

V. N. Churmateeva, USA: THE TRAINING OF MANAGEMENT PERSONNEL FOR INDUSTRIAL CORPORATIONS, Moscow, Nauka, 1975.

Additional Information:

143 pages

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Editor, V. T. Pysin (other technical editors omitted).

The critical analysis of the contemporary composition and of the biases of the educational system for managers in the USA, which the author produced in this book, allows the reader to become acquainted with the forms and the methods of professional preparation and ideological education of American managers, who remain even under current conditions true servants of big business.

The original materials extensively used in the book are of interest not only to the scholar and teacher but also to the great circle of practical workers in middle and upper management.

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Sistemnye Analiz v Upravlenii Narodnym Khoziaistvom. (Uchebnoe Posobie)

E.P. Golubkov, SYSTEM'S ANALYSIS IN THE MANAGEMENT OF THE NATIONAL ECONOMY,
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The improvement of management planning for the national economy on the current historical level of development of our society, demands the still more complete and logical application of system's analysis methods for the solution of problems at all (econ. P's) levels of the economy. In part, a report to the Central Committee of the 24th Congress of the Communist Party talks of this.

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The goal of the course is to give an idea of the methods of system's analysis for management decision-making which is necessary for an understanding of the possibility, the means of system's analysis and the correct use of its results. The materials of the lecture are that foundation on which it is possible to amass knowledge in the future, essential for competent application of the methods of system's analysis.

The present text is intended for students of the Executive Development Faculty.

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Avtomatizirovannaia Sistema Upravleniia (Teoriia i Metodologiia).

O. V. M. Kozlova, Editor: THE AUTOMATED SYSTEM OF MANAGEMENT (THEORY AND METHODOLOGY), Vol. 1, Moscow, Mysl', 1972

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455 Pages

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18,500 Copies

In the first volume of this monograph, theoretical investigations have been presented and generalized material is cited about the creation of the automated system of management. The primary principles and directions of its design, introduction and use are considered. Questions of the preparation of an enterprise for the introduction of an ASM and the organization of the technical-informational basis of management are brought to light.

The work is a result of many years of scientific investigation of a group of authors on questions of the theory of the creation of an ASM in social-economic systems. In it is reflected the practical work of enterprises with ASM's.

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V. E. Kurvits, Kh. Ia. Pur'e and L. I. Saulin, THE CASE-METHOD OF INSTRUCTION, Tallin, Valgus, 1975.

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Editor: A. Iurna (others omitted)

Translator from the Estonian I. Abramson

Published under the auspices of the Estonian Republic Scholarly Combine of Light Industry

Complicated Instruction is an active form of the organization of school work, in which knowledge, ability and skills are mastered by means of the independent solution of practical, actual, scholarly problems; by this issuing from the goal of the development of the cognitive abilities and creative thinking of the students.

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 - 12.18 The Enterprise.
 - 12.19 The Experiment of the Kiev Factory "Stroigomash."
 - 12.20 According to Personal Wishes...

Bibliography.

Organizatsionnye Struktury Upravleniia Proizvodstvom

B. Z. Mil'ner, Editor, THE ORGANIZED STRUCTURES OF INDUSTRIAL MANAGEMENT, Moscow, Ekonomika, 1975.

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Editor: A. S. Mel'nikova

The actual theoretical and practical questions of organized structures of management of socialist industry under current conditions, with an account of the tasks presented by the 24th Congress of the Communist Party of the Soviet Union, are presented in this book. The Soviet experience in the field is analyzed in depth. The practice of designing organized structures for the management of industrial associations in the USSR is generalized.

This book is intended for the directors and specialists of various branches of industry, scientific workers and teachers of economics at higher educational establishments (VUZy) and universities.

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Mathematicheskile Motody Planirovaniia Sel'skogo Khoziaistva

I.G. Popov, MATHEMATICAL METHODS OF AGRICULTURAL PLANNING,
Moscow, Kolos, 1974.

Additional Information:

128 Pages

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What Are Called Mathematical Methods of Optimal Planning? How to Compose and Resolve This or Another Problem for the Planning of Production? What Modes and Methods are Possible to Use for the Calculation of the Optimal Combination of the Branches in Kolkhozs and Sovkhozs, for the Rationing of Animal Feed, for Various Transport Problems? The reader will find the answer to these and many other questions in this book.

Intended for Specialists and Other Agricultural Workers.

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- 57 A Numeric Example.
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- 108 The Model for the Optimization of the Production Distribution and Agricultural Procurement Plans. Model B
- 110 The Model for the Improvement of State Procurement Policies for Agricultural Output.

Trud Rukovoditelia

G. Kh. Popov, THE WORK OF THE DIRECTOR: A TEXTBOOK FOR THE DIRECTORS OF ADMINISTRATIVE CADRES, Moscow, Ekonomika, 1975.

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Editorial Board:

V. G. Afanas'ev

D. M. Gvishiani

V. N. Lisitsyn

G. Kh. Popov

This textbook is devoted to questions of the rational organization of managerial work. The place of the director in the system of social production and his socio-economic functions are considered in detail. The style and methods of the manager's work, questions about the organization of the management apparatus and effectiveness of his work, come to light.

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	192	7.	The Organization of the Director's Work
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	198	7.2	The Official Conference, Presentation, Reception, Discussion.
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Upravlenie Sotsialisticheskoi Ekonomikoi

Protopopov, Editor: MANAGEMENT OF THE SOCIALIST ECONOMY, revised and amended second edition, Moscow, Mosk. Rabochii, 1975.

Additional Information

544 Pages

1 Ruble 20 Kopecks

40,000 copies in print

In the decisions of the 24th Congress of the Party (December, 1973) the plenum of the Central Committee of the Communist Party devoted great attention to problems of the improvement of national economic management. In this connection, the organization of study and the executive development of national cadres acquired special importance.

The present text was prepared by workers of the economics department of Moscow State University and the Center for Problems of the Management of Social Production; and is intended for teachers and students of evening school of Marxist-Leninism, for the higher teams of the party education system and also for various types of workers' economic study.

In the book, the basic questions studies in a course, "Management of the Socialist Economy" are considered. The book has been revised and amended in light of the recent presentations of the party and government, with an account of reader's impressions and suggestions from the first edition. In particular, four new lectures have been given. All lectures are supplied with methodological recommendations for the lecturer, director of the seminar and audience. Lists of supporting literature are given.

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13	<u>Part 1:</u>	The Scientific Basis of the Management of the Socialist Economy and its Improvement.
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18	2.	Literature.
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43	Lecture 2:	The Actual Problems of the Improvement of Management of the Socialist Economy.
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172	2. Literature.
173	Lecture 6: Legal Aspects of the Management of the National Economy.
199	<u>Part 4:</u> Management of Separate Spheres of the National Economy.
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206	2. Literature.
208	Lecture 7: Management of a Branch of the Socialist Economy.
245	Lecture 8: The Territorial Organization of Management of the Socialist Industry.
267	Lecture 9: Management of Socialist Agriculture.
295	Lecture 10: Organization and Management of Research and Development.
341	<u>Part 5:</u> Work, Rationalization and Technology in Management.
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348	2. Literature.
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461	<u>Part 6:</u> The Quality and Evaluation of Work of the Management Apparatus.
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464	2. Literature.
465	Lecture 15: Cadres of Economic Managers.
485	Lecture 16: The Personality of the Economic Manager.
501	Lecture 17: The Evaluation of Managerial Workers.
521	<u>Part 7:</u> Criticism of the Bourgeois and Petite-Bourgeois Theories of Management.
521	1. Methodological Recommendations.
521	2. Literature.
522	Lecture 18: Criticisms of the Bourgeois and Petite-Bourgeois Theories of Management

Upravlenie Sotsialisticheskim Proizvodstvom

V. A. Protopopov and G. Kh. Popov et al., THE MANAGEMENT OF SOCIALIST INDUSTRY, Moscow, Mosk. Rabochii, 1973, c. 1974.

Additional Information:

367 pages

41 kopecks

40,000 copies

Editor: E. Vasil'ev (others omitted)

The 24th Congress of the Communist Party devoted much attention to the problems of the improvement of management for socialist industry. The present mathematical textbook for seminar and practical study is intended to help in the instruction and study of these problems. The book considers questions of the instructional method for managerial skills and investigates specific examples of the solutions of managerial case studies which are met in practice. Methodological instruction and questions are accompanied by addresses to the participants of the seminars.

CONTENTS:

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First Part: Questions of the Organization and Method of Instruction for Managerial Skills.

- 14 **CHAPTER 1: The System of Preparation and the Executive Development of Economic Managers.**
- 30 **CHAPTER 2: The Content of Instruction for Economic Managers.**
- 63 **CHAPTER 3: The Use of Active Methods of Instruction in the Process of Management Cadre Preparation.**

Second Part: Specific Examples of Management Problems.

- 82 **CHAPTER 4: Economic Methods of Management.**
- 82 1. Case 1: Shveinii Association "Bol'shevichka."
- 105 2. Case 2: Shchekinskii Experiment.
- 127 3. Case 3: The Elaboration of the Principle of Inner-Factory khozraschet.
- 160 4. Case 4: Responsibility According to Economic Agreement.
- 168 **CHAPTER 5: The Improvement of the Managerial Organization of a Branch Industry.**
- 168 5. Case 5: The Rationalization of the Structures of an Industrial Ministry's Apparatus. (e.g., The Ministry of Forestry and Lumber Production).
- 193 **Approved For Release 2001/11/19 : CIA-RDP79-00798A000200020001-3**
Management in the Ministries and Departments of the RSFSR.

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311	CHAPTER 6: The Improvement of Work with Cadres.	
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334	11.	Case 11: The Selection of a Manager.
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352	13.	Case 13: Interrelations in the Collective.
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Sistemnyi Podkhod v Perspektivnom Planirovanii

B. A. Raizberg, E.P. Golubkov, - L.S. Pekarskii, THE SYSTEMATIC APPROACH TO LONG-TERM PLANNING, Moscow, Ekonomika, 1975.

Additional Information:

264 Pages

1 Ruble 6 Kopecks

10,000 copies

Editor; L. A. Konikov (others omitted).

In the book, the foundations of the systematic approach to the construction of long-term plans is set forth. Questions of the utilization of system's analysis in long-term economic planning of the country are considered.

System's analysis in planning is necessarily connected with the elaboration of complex programs for the development of the national economy, which a significant part of this book considers. In the book, the essence, structure, successive elaboration and the inter-dependence of programs and plans is described. Their indicators are analyzed. A diagram of proposed programs is presented.

The book is intended for workers of planning agencies, ministries and departments, production associations, scientific research institutes, teachers in VUZy. It can be used by specialists in the system of economic education of the higher level management teams.

CONTENTS

Pg. 3	Introduction
13	CHAPTER 1. The Historical Experience of the Application of the Systematic Approach to National Economic Planning.
13	1. The Origin and Development of the System's Approach.
25	2. The System's Approach at the Current Stage of Development.
32	CHAPTER 2: System's Analysis - the Methodology for the Solution of Complicated Problems of Management and Planning.
32	1. The Basic Concepts of System's Analysis.
35	2. The Essence of the Systematic Approach.
39	3. Principles and Applications of System's Analysis.
46	4. The Basic Logical Elements of System's Analysis.
55	5. The process of System's Analysis.
59	6. The Characteristics of Socio-Economic System's Analysis.
63	CHAPTER 3: The Methods of Systematic Complex Planning for the National Economy.
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70	2. The Initial Principles of Planning Socialist Industry.
72	3. The Ways and Means for the Systematic Implementation of Socialist Planning Principles.

THE SYSTEMATIC APPROACH TO LONG-TERM PLANNING

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Pg. 86	4. The Logic and a Logical Diagram of the National Economic Planning.
105	5. The Methods and the Technology of Complex National Economic Planning.
120	6. Methods of System's Analysis as a Means for the Optimization of the Plan.
126	CHAPTER 4: Programmed Special Purpose Planning.
126	1. The Essence of Programmed Special Purpose Planning.
130	2. The Definition of a Program; the Program and the Plan; Types and Classes of Programs.
135	3. The Programmed Special Purpose Approach to Long-Term National Economic Planning.
138	4. Programmed Special Purpose Planning as a Source or Raising the Effectiveness of Social Production.
141	CHAPTER 5: The Structure, Contents and Successive Development of Programs.
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149	2. The Consistency and Content of a Program's Explanation.
184	CHAPTER 6: Programmed Planning on the National Economic Level
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190	2. The Methodological Foundations for the Development of Complex Programs Which Form Part of the Long-Term Plans of National Economic Development.
199	3. The Organization and Order of Development of Programs to Form Part of the Long-Term Plans for National Economic Development.
206	4. Programmed Special Purpose Planning and Economic Regulation.
212	CHAPTER 7: Programmed Special Purpose Planning at the Branch Level.
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220	2. Basic Scientific-Methodological Questions About the Organization of Programmed Special Purpose Planning at the Branch Level.
229	3. An Information and Procedure Diagram of Branch Program Special Purpose Planning.
247	4. The Organizational Basis (guarantee) of Programmed Special Purpose Planning in a Branch.
254	5. Automated Systems of Management as an Instrument of Programmed Special Purpose Planning.
264	Literature.

The Industrial Business Game "Astra".

The Educational Business Game "Impul's".

The Plan of Work of the Tallin House of Engineers of the Estonian Republic Soviet Scientific-Technical Organization on September - December, 1975.

Program of the course --"Business Games" - - and The Themes of Class Work for the course "Business Games," speciality #2035.

The course plan -- Speciality #1701 - Economic Planning and #2035 - Economic Cybernetics.

The Methodological Development of Experimental Limited Resource Planning.

V. I. Marshev and V. F. Mikhalev, "CASE STUDY AND MANAGEMENT GAMES IN THE TRAINING OF ECONOMISTS AND MANAGERS", Vestnik MGU, (2, 1975).

The Course Plan: Speciality #2012, Psychology.

Nauka i Upravlenie,
Aktual'nye Problemy Upravleniia

V. G. Shorin, Editor: ACTUAL PROBLEMS OF MANAGEMENT: Book 1 in the series -
Science and Management, Moscow, Znanie, 1972.

Additional Information:

282 Pages
56 Kopecks
50,000 Copies

This book is devoted to contemporary problems of management. Its authors are famous Soviet scholars.

The book consists of six chapters, in which the following questions are considered: problems and the future of management organization; principles of the construction of automated systems of managements, and organized systems of management; optimal planning for the national economy; economic-mathematical models; systems of economic information for enterprises.

Designed for specialist participating in the management of the national economy on all levels: the branch, association and enterprise.

CONTENTS:

Pg. 3	Forward
13	CHAPTER 1: The Science of Management-Problems and Perspectives of Organized Management.
69	CHAPTER 2: The Construction of Automated Systems of Management--Basic Principles.
98	CHAPTER 3: Organized Systems of Management--The Building Principles of a Structural Diagram.
140	CHAPTER 4: Optimal Planning for the National Economy.
193	CHAPTER 5: Branch and Territorial Planning--Economic-Mathematical Models.
228	CHAPTER 6: The Management of Industry--The System of Economic of Economic Information.

Nauka i Upravlenie

Pravovye i sotsial'no-psikhologicheskie aspekty upravleniia

V. G. Shorin, Editor: THE LEGAL AND SOCIAL-PSYCHOLOGICAL ASPECTS OF MANAGEMENT,
Book 2 in the series, Science and Management, Moscow, Znanie, 1972.

Additional Information:

320 Pages

58 Kopecks

50,000 Copies

The collective of authors acquaints economic managers with the fundamental concepts of law, questions of the psychology and the sociology of specific sociological investigations on work.

CONTENTS

Pg.	3	Introduction
3	<u>Part 1:</u>	The Legal Foundations of the Leadership of the National Economy.
7	1.	Economic Law and its Role in the Leadership of the Economy.
26	2.	The Legal Position of the Economic Apparatus.
53	3.	The Legal Condition of Property of the Economic Apparatus. Lawful Forms of Planning and Economic Accounting.
71	4.	Economic Negotiation. The Responsibility for the Results of the Work of the Economy.
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89	<u>Part 2:</u>	Social-Psychological and Pedagogical Aspects of Management.
90	1.	The Goals and Tasks of Specific Sociological Investigations about Industry.
114	2.	Informational Co-operation Between Man and Machine in Management Systems.
141	3.	The Work of Man, its Structure and the Mechanism of Regulation. The Dynamics of Efficiency.
173	4.	The Psychology of Promoting Work Efficiency.
188	5.	Problems of Personal Psychology, Individual Differences Between People and the Psychological Aspect of the Selection Preparation and Promotion of Cadres.
211	6.	The Group Activity of People, the Formation of Work Collectives and the Psychological Aspects of their Management.
241	<u>Part 3:</u>	The Planning of the Social Development of the Enterprise Collective.
242	1.	The Characteristics of Complex Social Planning.
255	2.	The Planned Change of the Social Structure of the Industrial Collective.
277	3.	The Improvement of the Conditions of Work & Health Safeguards.
286	4.	The Increase and Improvement of Wages. The Improvement of the Living and Cultural and Social Conditions of Enterprise Workers.
296	5.	Approved For Release 2001/11/19 : CIA-RDP79-00798A000200020001-3 The Communist Education of the Personality and the Development of the Workers' Social Awareness.

Nauka i Upravlenie

Problemy Upravleniia Naukoi v Usloviakh Nauchno-Tekhnicheskoi Revoliutsii.

V. G. Shorin, Editor: PROBLEMS OF THE MANAGEMENT OF SCIENCE DURING THE SCIENTIFIC-TECHNICAL REVOLUTION: Book 3 in the series, Science and Management, Moscow, Znanie, 1972.

Additional Information:

224 Pages

48 Kopecks

50,000 Copies

The collection acquaints the reader with managerial problems of science during the scientific-technical revolution. The organization of the management of science, the ways of improving the organization of scientific investigation are shown in the book. The evaluative-normative management of science and the paths to higher effectiveness in the management of science as a whole are analyzed. The role of predicting scientific-technical progress is considered and its specific methods are described.

CONTENTS:

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50	Chapter 2: About the Ways of Improving the Organization of Scientific-Investigatory Activity
77	Chapter 3: Evaluative-Normative Management -- The Long-term Type of Management During the Scientific-Technical Revolution.
106	Chapter 4: About the Ways of Increasing the Effectiveness of the Management of Science.
175	Chapter 5: Predicting Scientific-Technical Progress.

Nauka i Upravlenie
Ekonomiko-Matematicheskie Metody i Modeli Planirovaniia i Upravleniia

V. G. Shorin, Editor: ECONOMIC MATHEMATICAL METHODS AND MODELS OF PLANNING AND MANAGEMENT: Book 4 in the series - Science and Management, Moscow, Znanie, 1973

Additional Information:

240 Pages
51 Kopecks
47,000 Copies

The book is devoted to the application of economic mathematical methods in the management of the national economy.

The book consists of ten chapters, in which the following questions are considered: the inter-relation of planning and economic-mathematical methods; mathematical and simulated modeling; mathematical dynamic and linear programming; the applied areas of probability theory and mathematical statistics, typical problems of the investigation of operations; sets of complex economic mathematical models for branch and inner-factory planning.

The book is intended for specialist who participate in the management of the national economy on all levels: branch, association and enterprise.

CONTENTS:

Pg. 5	CHAPTER 1: Planning and Economic-Mathematical Methods.
17	CHAPTER 2: Mathematical Models.
41	CHAPTER 3: Mathematical Programming.
50	CHAPTER 4: Linear Programming.
72	CHAPTER 5: Dynamic Programming.
98	CHAPTER 6: About the Basic Applied Areas of Probability Theory and Mathematical Statistics.
133	CHAPTER 7: Simulation Modeling.
157	CHAPTER 8: Typical Problems of the Investigation of Operations.
176	CHAPTER 9: The Set of Economic-Mathematical Models for Branch Planning.
203	CHAPTER 10: The Set of Models for Inner-Factory Planning.

Nauka i Upravlenie
Avtomatizirovannye Sistemy Upravleniia

**V. G. Shorin, Editor, AUTOMATED SYSTEMS OF MANAGEMENT,
Book 5 in the series Science and Management, Moscow, Znanie, 1973.**

Additional Information:

320 pages

63 kopecks

42,000 copies

In the book the basic concepts of contemporary automated systems of management are considered. The general knowledge and principles of their construction, and the set of questions connected with the creation of automated systems of management for enterprises are given. The foundations of the construction and stages of development of branch automated systems of management are set forth.

The book is meant for engineer-technical workers who study automated systems of management, directors of enterprises, departments and ministries and also students of VUZy in corresponding specialities.

CONTENTS:

Pg. 10	CHAPTER 1: Basic Concepts about Automated Systems of Management.
10	Automated Systems of Management and the Elaboration of Data.
21	The Construction of Automated Systems of Organized Management.
40	CHAPTER 2: The Creation of Automated Systems of Management for Enterprises
40	The Fundamental Stages of the Elaboration of Automated Systems of Management for Enterprises.
40	General Theories.
45	Pre-Design Stages.
72	The Elaboration of Technical Designs.
93	Work Design.
109	The Design and Organization of Computer Information Centers (IVTs).
130	The Elaboration of Separate Economic Sub-Systems of Automated Systems of Management for Enterprises.
131	Sub-Systems of Technical-Economic Management.
132	Technical Economic Planning (TEP).
147	Accounting Calculation.
153	Sub-Systems of Operative Management of a Basic Industry.
176	CHAPTER 3: The Creation of Branch Automated Systems of Management.
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209	The Main Computer Center of an Automated Branch Management System.

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- Pg. 217 The Technological Method of Data Processing at the Main
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- 230 The Elaboration of Separate Functional Sub-Systems of Automated
Branch Management Systems on the Example of "ASM-Instrument. "**
- 230 Sub-Systems of Technical-Economic Planning and the Analysis
of the Plan's Indicators.**
- 242 Sub-Systems of Operative Management.**
- 242 Basic Theories and Problems being Solved by a Sub-System.**
- 245 The Organizational Structures of a Sub-System.**
- 248 Functional Sub-Systems.**
- 253 A Short Compilation of Tasks Being Solved by a Sub-System.**
- 266 Addendum.**

Nauka i Upravlenie
Vvedenie v Avtomatizirovannye Sistemy Upravleniia.

V. G. Shorin, Editor, **AN INTRODUCTION TO AUTOMATED SYSTEMS OF MANAGEMENT**, Book 7 in the series Science and Management, Moscow, Znanie, 1974.

Additional Information:

320 pages

61 kopecks

40,000 copies

The next volume of the series Science and Management is devoted to basic concepts, principles and characteristics of cybernetics as a theoretical basis for automated systems of management. In the second part of this volume, the systems, working principles and possibilities of electronic digital computers--the most powerful technical means for the creation of automated systems of management--are investigated.

CONTENTS:

Pg. 3 Introduction

7	PART 1: The Fundamental Concepts, Theories and Principles of Cybernetics.
7	CHAPTER 1: Cybernetics and its Characteristics.
7	1.1 A Definition of Cybernetics.
10	1.2 The Source of Cybernetics.
16	1.3 The Characteristics of Cybernetics.
22	1.4 The Classification of Cybernetics.
27	CHAPTER 2: Cybernetic Systems.
27	2.1 A Definition of the System.
30	2.2 The Action of the System.
31	.1 The Input and Output of the System.
32	.2 The Scope of the System.
38	.3 Re-organization.
39	.4 The Concepts of the Dynamic Capabilities of the System.
41	2.3 The Classification of Cybernetic Systems.
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45	3.1 General Concepts.
52	3.2 The Concept of the "Black Box," an Isomorphous System.
54	3.3 The Simplified Homomorphous Model.
55	3.4 The Mathematical Model.
58	.1 The Model of Transport Problems.
67	.2 The Model of Planning the Capability of Technological Equipment.
72	.3 An Economic-Mathematical Model of a Coal Mine.
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AN INTRODUCTION TO AUTOMATED SYSTEMS OF MANAGEMENT

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90	4.2 The Concept of "Inverse" Ties.
95	4.3 Automated Management.
96	.1 Basic Types of Automation.
107	.2 Elements of Systems of Automated Regulation.
104	.3 Statistical and Non-Statistical Systems of Automated Regulation.
[SIC] 107	.4 Statistics of Control.
112	.5 The Dynamics of Control.
117	.6 Programmed Management.
120	.7 The Control System.
122	.8 Optimal Management.
125	4.4 A Simplified Diagram of Industrial Management in the Theoretical Terms of Automated Control.
128	CHAPTER 5: Elements of the General Theory of Communication.
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130	5.2 Communication and Signals.
132	5.3 Codification and Modulation.
135	5.4 The Line and Canal of Communication. Obstacles.
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139	5.6 Examples of the Codification of Information.
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158	6.3 The Quantity of Information. Entropy.
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165	1.1 General Principles of the Construction of Electronic Computers.
169	1.2 Managing the Information of Computers.
174	1.3 The Time Diagram of Computer Work.
178	1.4 Classification of Computers.
192	CHAPTER 2: The Arithmetic and Logical Base of Computers
192	2.1 The Forms of Numeric Input into Computers.
194	2.2 The Methods of Numeric Codification
195	2.3 The Algebra of Logic.
199	CHAPTER 3: Elements and Assemblies of Computers.
199	3.1 Elements of Computers.
202	3.2 Assemblies of Computers.
206	CHAPTER 4: Arithmetic Systems of Computers.
207	4.1 The Structural Function Characteristics of Arithmetic Systems.

AN INTRODUCTION TO AUTOMATED SYSTEMS OF MANAGEMENT

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218	4.3	The Operation of Displacement.
220	4.4	Multiplication in the Binary System of Notation.
225	4.5	Methods of Accelerating Multiplication in a Computer's Arithmetic Systems.
231	4.6	The Tabular Methods of Multiplication and Rounding-off.
234	4.7	Division in a Computer's Arithmetic Systems.
242	CHAPTER 5: Computer Memory Systems.	
242	5.1	The General Characteristics of Memory Systems.
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268	5.3	The Structural and Functional Characteristics of Memory Systems.
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Nauka I Upravlenie
Sistemnyi Analiz I Struktury Upravleniia

V. G. Shorin, Editor; SYSTEMS'S ANALYSIS AND STRUCTURES OF MANAGEMENT,
Book 8 in the Series Science and Management, Moscow, Znanie, 1975.

Additional Information:

304 Pages

64 Kopecks

24,000 Copies

In the book, fundamental concepts connected with the system's approach to the problems of the management of organized systems are set forth. A definition to the theory of systems and system's analysis in current science is given. The use of mathematical means of investigation in operations for decision-making is considered. Several principles of the current approach to the analysis and synthesis of organized structures of management are cited.

This book is intended for the wide readership of engineer-technical workers, studying automated systems of management, directors of enterprises, departments, ministries and also VUZy students in appropriate specialities.

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		The Elements of System's Analysis.
	8	The Concept of the General Theory of Systems and the Systems Approach in Current Science.
	8	Basic Concepts.
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	16	The General Theory of Systems.
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	18	The Definition of a System.
	19	Physical and Abstract Systems.
	22	Systems and Their Environment.
	25	Macroscopic and Microscopic Points of View on the Behavior of a System.
	28	Natural and Artificial Systems.
	32	Managing Systems.
	32	The Concept of Cybernetics.
	41	The Characteristics of Management Systems.
	51	CHAPTER 2:
		Examples of the System's Approach.
		The System's Approach for the Forecasting and the Long-term Planning of Branch Scientific Research and Development.
	60	The Realization of the System's Approach in Long-Term National Economic Planning.
	69	CHAPTER 3:
		The Bases of the Theory of Decision-Making.
	69	Management Decision-Making.
	80	The Investigations of Operations and the Analysis of Systems--Fundamental Principles and Content.
	88	The Goal of the Operation, an Indicator of the Effectiveness of the Operation, the Criterion and the Limitation.

- pg. 95 The Model of the Operation. Basic Principles of its Construction.
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 105 The Forecasting of Information Necessary for Decision-making.
 114 Mathematical Programming (Methods of Optimization).

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 201 The Informational Aspect.
 201 Information Sources in Organization.
 204 The Distribution of Information According to the Functions of Management.
 208 The Analysis of Information in Organized Structures.
 211 The Influence of Information Connections on the Structures of Contemporary
 Organizations.
 218 The Types of Structures and their Characteristics.
 218 The Hierachy.
 219 Co-Ordination.
 220 Centralization and Decentralization.
 222 Current Trends in the Design of Organizations.
 233 Organized Structures of Management of the National Economy.
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 236 The Structure of Management of the National Economy.
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 269 The Organization of Tasks.
 273 The Design of Management Systems with a Limited number of Functions.
 285 The Design of the Structure of a Medical Institute.
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R E C O R D

of the meeting in the USSR of American and Soviet Coordinators and Experts of the Joint US-USSR Working Group for Cooperation in the Application of Computers to Management in Regard to Topic 5, "Computer-Aided Refinement of Decision-Making and Education of High-Level Executives."

In accordance with the Agreement between the Governments of the USA and the USSR on Scientific and Technical Cooperation of May 24, 1972, and the Report of the US-USSR Working Group in the Field of the Application of Computers to Management signed in Moscow on November 28, 1973, as well as in accordance with the Protocol of the meeting in the U.S. of Coordinators and Experts in regard to Topic 5, signed in December, 1974, a meeting of Coordinators and Experts on Topic 5 was held in the USSR from September 18 to October 1, 1975.

The itinerary of the American specialists in the Soviet Union included visits to institutions of higher education, academic and branch research institutes, institutions of training and refinement, computer centers, and industrial and commercial establishments. A fully-documented itinerary in the Soviet Union of the American delegation on Topic 5 is found in Attachment I of this protocol. A listing of those individuals who participated in the meetings and discussions held during the visit is found in Attachment II.

During the visits to these institutions and organizations American and Soviet experts exchanged opinions on the main aspects of Topic 5 and provided detailed answers to all questions of interest to the participants of the meetings. The coordinators of both sides prepared plans for American-Soviet scientific and technical cooperation for Topic 5. The descriptions of the proposed subtopics are in

Attachment III. The descriptions of specific activities recommended

- 2 -

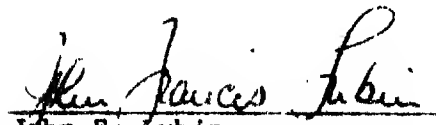
for immediate implementation are contained in Attachment IV. It is recognized by the coordinators for both sides for Topic 5 that these proposed plans must receive the approval of the American and the Soviet Co-Chairmen of the US-USSR Joint Working Group on Application of Computers to Management.

Both sides have agreed that an important problem for the next phase of cooperation for Topic 5 is the elimination of the terminology barrier between the experts. This should be realized in the joint preparation of a Glossary on the Application of Computers to Economics and Management. The construction of this Glossary must be a part of the activities of each visit and workshop carried out under this agreement.

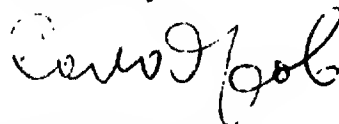
It is agreed by both sides that one form of cooperation is the exchange of lecturers for specific courses in all subtopics of Topic 5.

Both the American and Soviet sides have agreed that the activities in the framework of Topic 5 will be aimed at methodological and practical results.

Done in Moscow this 30th day of September 1975, in duplicate in the English and Russian languages, both equally authentic.


John F. Lubin
US Coordinator for Topic 5

On behalf of
N.N. Ivashchenko
USSR Coordinator for Topic 5
M.V. Solodkov
Dean, Economic Faculty of
Moscow State University



ATTACHMENT I

Itinerary of American specialists in the USSR from September 18 to October 1, 1975, on Topic 5, "Computer-Aided Refinement of Decision-Making and Education of High-Level Executives."

Thursday, 18 September	Arrival of the delegation at the Airport Sheremechevo.
Friday, 19 September	Meetings at the Ministry of Higher and Specialized Education of the USSR; the Rectorate of Moscow State University; and Economics Faculty of Moscow State University.
Saturday, 20 September	Meetings at Moscow Institute of Management named after Ordjonikidze, and Institute of National Economy named after Plekhanov.
Monday, 22 September	Meeting at Leningrad Institute of Finance and Economics.
Tuesday, 23 September	Meetings at Tallinn Polytechnic Institute, and the All-Union Council of Scientific and Technical Societies, Tallinn.
Wednesday, 24 September	Meetings at the Training and Refinement Institute of the Ministry of Light Industry, Estonia, Tallinn; and the Tallinn Excavator Plant.
Thursday, 25 September	Meeting at the Interindustry Institute of Training, Riga.
Friday, 26 September	Meeting at the Riga Polytechnic Institute, and visit to Riga Wholesale Trade Office of Central Union and Latvian Union of Cooperative Societies
Monday, 29 September	Meeting at the Institute of Management of the National Economy, and visit to the Zil Automobile Plant.
Tuesday, 30 September	Meetings at the USA Institute, and the Central Economics and Mathematics Institute, Moscow.

ATTACHMENT II

US participants in the September 18-October 1, 1975, meetings in the USSR of Coordinators and Experts on Topic 5

D. Don Aufenkamp
Head, Computer Applications in Research
National Science Foundation

US Chairman, US-USSR Joint Working Group on Scientific and
Technical Cooperation in the Field of the Application of
Computers to Management

John F. Lubin
Associate Dean and Professor of Management
The Wharton School
University of Pennsylvania

US Coordinator, Topic 5, US-USSR Joint Working Group on Scientific
and Technical Cooperation in the Field of the Application of
Computers to Management

John E. Austin
Lecturer on Business Administration
Graduate School of Business Administration
Harvard University

Egon Loebner
Counselor for Scientific and Technological Affairs
US Embassy

- 2 -

Soviet participants in the September 18-October 1, 1975, meetings
in the USSR of Coordinators and Experts on Topic 5

Ministry of Higher and Secondary Specialized Education of the USSR
Moscow

N.S. Ygorov, Deputy Minister
N.N. Ivashchenko, Deputy Chief, Main Department of Higher
Educational Institutions; USSR Coordinator, Topic 5, US-USSR
Joint Working Group on Scientific and Technical Cooperation
in the Field of the Application of Computers to Management
A.K. Kalinin, Chief, Main Department of Scientific Research,
Ministry of Higher and Secondary Specialized Education of the RFSSR
V.V. Semin, Deputy Chief, Department of Personnel
A.M. Tsiganenko, Deputy Chief, Department of Instruction and
Methodology

Rectorate of Moscow State University
Moscow

F.M. Volkov, Pro-Rector
M.M. Maslov, Pro-Rector
A.S. Pankratov, Deputy Pro-Rector
M.V. Solodkov, Dean, Economics Faculty
A.N. Tikhonov, Dean, Computer Faculty
A.N. Leontyev, Dean, Psychology Faculty

Economics Faculty, Moscow State University
Moscow

I.P. Faminsky, Deputy Dean
U.N. Speranskaya, Deputy Dean
E.Z. Maiminas, Professor
U.N. Bronnikov, Associate Professor
G.N. Zoteev, Associate Professor
V.M. Yfimov, Senior Lecturer
V.J. Marshev, Senior Research Fellow
A.N. Sobronin, Postgraduate
A.V. Fadeyev, Postgraduate

Ozdjonikidze Institute of Management
Moscow

M.A. Bishaev, Pro-Rector
V.S. Rummyantsev, Dean
G.A. Bryansky, Dean
V.J. Mamontov, Chief of Chair
I.V. Kuznetsov, Doctor of Economic Sciences
I.A. Ivanov, Associate Professor

- 3 -

Plekhanov Institute of National Economy
Moscow

I.G. Popov, Pro-Rector
B.I. Iskyakov, Chairman of Department
V.U. Ozira, Chairman of Department
A.V. Korchagin, Chairman of Department
G.A. Yeremeyev, Chairman of Department

Leningrad Finance and Economics Institute
Leningrad

U.A. Lavrikov, Rector
L.S. Tarasevich, Pro-Rector
I.M. Syroyezhin, Chairman, Department of Economic Cybernetics
I.V. Romanovsky, Professor
S.R. Gidrovich, Senior Lecturer
U.U. Kurolepin, Senior Research Fellow

Tallinn Polytechnic Institute
Tallinn

N. Tiismus, Pro-Rector
R. Uksvarav, Professor of Organization and Management
M. Habakuk, Associate Professor of Organization and Management
O.R. Lillenurm, Chief of Department

All-Union Council of Scientific and Technical Societies
Tallinn

L. Savelyev, Chairman of Laboratory of Estonian Institute of Information
L.I. Saulin, Chairman of Department of Labor, Estonian State Committee
U. Runkla, Chairman of Department
I. Partelnoeg, Chairman of Department

Training and Refinement Institute, Estonian Ministry of Light
Industry, Estonia

Tallinn

J.O. Portnoi, Director of Center of Scientific Organization of Labor
H.I. Cala, Chairman of Teaching Department

Tallinn Excavator Plant

Tallinn

I. Andel, Director

- 4 -

Interindustry Institute of Training

Riga

A.I. Andricson, Director
A.K. Krastinsh, Deputy Director
N.T. Ivanov, Dean, Management Faculty
M. Frobtuk, Dean, Economics Faculty
I.V. Staaran, Dean, Engineering Faculty
V.P. Nikishin, Chairman of Department
G.A. Forshin, chairman of Department

Riga Polytechnic Institute

Riga

I.N. Ilyin, Pro-Rector
A.I. Strakov, Pro-Rector
U.A. Freimanis, Pro-Rector
A.N. Borisov, Chairman of Department
I.A. Stazdin, Chairman of Department
L.V. Nitsetsky, Chairman of Department
O.B. Lyusin, Chairman of Department
I.P. Leontyev, Chairman of Department
A.P. Spalvinsh, Chairman of Department
U.A. Briedis, Chairman of Department
V.L. Nazarov, Chief of Computer Center

Riga Wholesale Trade Office of Central Union and Latvian Union
of Cooperative Societies

Riga

R.I. Denisov, Director
G. Grivinsh, Chief of Computerization Techniques and MIS
Department, State Planning Committee, Latvian SSR

Institute of Management of National Economy

Moscow

V.G. Shorin, Rector
L.I. Strelnikov, Pro-Rector
A.P. Polezhayev, Professor
A.S. Roshchin, Professor
V.S. Bobintsev, Associate Professor

Zil Automobile Plant

Moscow

V.V. Kalinin, Deputy General Director, Zil Corporation
A.P. Lizo, Rector, Zil Technical Institute
V.N. Mosin, Chairman of Department, Zil Technical Institute
M.N. Churaryov, Deputy Chief, External Relations Department

ATTACHMENT III

Description of Subtopics

1. System of Management Education and Training

1.1 Management Education in the USA and the USSR: System and Forms

Training centers--their types and orientation, financing, number and type of trainees.

Curricula of management training--curricular issues, academic and methodological.

Training activities in industry; survey of management development programs.

Interindustry aspects of management education.

1.2 Management Education of High-Level Managers

Definition of the term, "High-Level Managers" (High-Level Managerial Body).

Specific characteristics of training and development of high-level management.

Selection of candidates. Placement.

Continuing relationships between graduates and educational and training institutions.

Improvement in curricular and instructional methods for such trainees.

1.3 Management Education for Management Personnel of Enterprises in the USSR and Corporate, Governmental and Not-for-profit Enterprises in the USA

Definition of terms.

Methods of on-the-job training for personnel in this classification.

Differences at different levels in the organizational structure and in line and staff positions.

Curricula and course content.

Models of variations in curricula for managers and specialists, line and staff.

- 2 -

2. Planning and Forecasting Requirements for Managers and University-level Graduates for Industry and Government

2.1 Planning and Forecasting Requirements for University-level graduates in the USA and the USSR.

Definition and classification of specialists by type of higher education.

Methods of planning and forecasting requirements for specialists.

Procedures for collecting and processing basic information about such personnel.

Organizations for such forecasting and planning in the USA and the USSR.

2.2 Planning and Forecasting Requirements for Managerial Personnel in the USA and the USSR.

The nature of the managerial task.

Determination of current and future requirements for managers.

Methods of analysis for such determinations: factors involved, dynamics of the situation and environment, numbers needed.

Numbers of students and trainees in the management education system.

Classification and differentiation of management training by rank and function.

2.3 Mathematical Models Used in Planning and Forecasting Requirements for Managers

3. Methods of Management Education

3.1 Teaching Managers through Interactive Methods.

Descriptive summary of interactive methods of education in the USA and the USSR.

Experience of using interactive classroom teaching methods in schools of business and management in the USA.

Experience of using interactive classroom teaching methods in the USSR.

Approved For Release 2001/11/19 : CIA-RDP79-00798A000200020001-3
Methods and practices of the preparation of teaching "cases" in the USA and the USSR.

- 3 -

Exchange of experiences in teaching by the "case method."

3.2 Teaching Managers through the Use of Computers

Role of the computer in managerial decision-making in the USA and the USSR.

Qualitative and quantitative aspects of decision-making; role of systems analysis.

Methods of teaching with computer-based problems in managerial economics, mathematical model building and statistics.

3.3 Teaching Managers through the Use of Other Forms of Educational Technology

Descriptive summary of methods of instruction using other forms of educational technology in the USA and the USSR.

Forms of preparation for teaching managers through the use of educational technology.

Effects on learning of the "man-machine" relationship.

3.4 Psychological Aspects of Management Education

Relationship between group learning and individual needs.

Accelerated methods of instruction.

Improvement of efficiency of the management education process.

4. Simulation Gaming (Management Games and Collective Decisions Games) as a Training Tool for High-Level Managers

4.1 Simulation Gaming as a Tool for Learning Complex Decision-Making

The use of simulation gaming for studying the process of decision-making and for its improvement.

4.2 Effectiveness of Simulation Gaming in Training High-Level Managers: Theoretical and Experimental Research.

Development of methods of measurement for evaluation of effectiveness in the use of simulation gaming in training.

Investigation of the efficiency of simulation gaming as a teaching device for management education as compared with other tools.

- 4 -

4.3 Simulation Gaming and Computerized MIS (AMS)

Simulation gaming as a method of establishing communications between the managers and computer-based information system specialists.

ATTACHMENT IV

Forms of Cooperation and Specific Activities for Topic 5

Subtopic 1

1. A working team will be selected made up of 10 individuals, 5 from the USA and 5 from the USSR, to work jointly on this project. The members are to be appointed by 31 December 1975.
2. Each side will prepare a working paper of the situation as they see it in management education and training in their own country for their colleagues of the other side by 1 April 1976. They will also send a collection of appropriate literature about this subject to their counterparts by that date.
3. During the Fall of 1976 and before 31 December 1976 each side will visit the other country for a period of 4-6 weeks. They will visit institutions of higher education, management training operations in enterprises, both public and private, and research centers in management and management education.
4. By 1 April 1977 each side will complete a working paper of their understanding and analysis of the system of management education and training in the other country. These working papers are then to be exchanged.
5. The USSR side will visit their counterparts in the USA in June 1977 for a working session of five days. During the visit each side will discuss each others working papers and correct and modify them based on the discussions held.
6. Each side will then complete their papers in final form, outlining their understanding and analysis of management education in the other country by 31 December 1977. The reports will also include specific recommendations for further joint cooperation in management education. The two reports will be published in parallel in one document in both English and Russian.

Subtopic 2

1. Two seminars will be conducted in theoretical and practical problems in planning and forecasting requirements for managers and specialists in the USA and the USSR. There will be 20 participants at each, 10 from each side. The first seminar will be held in the USSR in September 1976 and the second in the USA in January 1977. Each seminar will be for about five days.

- 2 -

2. A joint final report of the results of the presentations and discussions at seminars will be completed by 31 December 1976. In addition to summarizing the results of the meetings, the major purpose of the report will be to recommend specific further joint research efforts that might be valuable in this topic area.

Subtopic 3

1. Two joint working groups will be selected by 31 December 1975. Each will include 5 individuals.
2. Materials on Subtopic 3 will be collected and exchanged by January 1976.
3. Seminars will be held in the USA with 10 Soviet scientists and lecturers in April 1976, and in the USSR with 10 US scientists and lecturers in September 1976.
4. Materials of the seminars held in the USA and the USSR will be published (in both English and Russian) in January 1977 and June 1977 respectively.
5. Courses on the use of active methods, statistical models and computer techniques in management training will be developed and held: in the USA in November-December 1976; in the USSR in April-May 1977. Each side will select 3 lecturers for these courses.
6. Joint publications on Subtopic 3 will be published: collected articles in the second quarter of 1977; a monograph in the fourth quarter of 1977.

Subtopic 4

1. A working team will be selected composed of 6 individuals, 3 from the USA and 3 from the USSR, to work jointly on this project. The members will be appointed by 31 December 1975.
2. Each side will prepare a separate national survey paper for their colleagues of the other side, including a collection of appropriate simulation gaming literature from their country by 31 May 1976.

- 3 -

3. The USSR side will visit their counterparts in the USA in the Fall 1976, their visit to overlap the Annual National Gaming Council Symposium. During the visit each side will conduct instructional seminars, work on the joint report, and the USSR side will visit appropriate centers of simulation gaming. The USA side will visit in the USSR in the Spring of 1977, meet with their colleagues in seminars, work on the joint final report, and visit institutions of importance in simulation gaming in the USSR. The period in each country will be from 3 to 4 weeks.
4. Members of both sides will exchange literature about those simulation games available to them, including instructional material, administrators notes, and program decks for computerized games.
5. A joint final report of the effort will be completed for publication by the end of the academic year 1976-1977 which will include specific recommendations for further joint cooperation in simulation gaming.

Pardon

Protocol

of the meeting in the U.S. of American-Soviet coordinators and experts of the U.S.-U.S.S.R. Working Group in the Field of Application of Computers to Management.

STATINTL

SECTION I

In accordance with the agreement between the U.S. and the U.S.S.R. on Scientific and Technical Cooperation in the Field of Applications of Computers to Management, signed in Moscow on November 28, 1973, and in accordance with agreed-upon plans, a meeting of coordinators and experts in regard to Topic #1 and Topic #2 (Econometric Modeling; Computer Analysis Applied to the Economics and Management of Large Systems) took place in the United States from April 20 to May 4, 1975. The Soviet delegation was headed by Deputy Chairman of GOSPLAN, N.P. Lebedinskiy.

The delegation visited and participated in scientific discussions with U.S. experts on concrete problems and methods in the field of Computer Applications to Management at the National Bureau of Economic Research, New York City and Washington, D.C.; The Gates Rubber Company, Gates Cyclo Inc., Denver, Colorado; U.S. Bureau of Reclamation, Denver, Ft. Collins, Loveland and Estes Park, Colorado; Colorado State University, Ft. Collins, Colorado; Farr Farms Inc., Monfort of Colorado and Allard Ranch, Greeley, Colorado; Ford Motor Company, Sesco Inc., The Cross Company, Burroughs Corporation, Detroit.

The delegation also visited with U.S. Government officials in Washington, D.C. These visits and discussions included Department of Treasury, Department of Interior, Bureau of Census, Office of Management and Budget, U.S. Senate, U.S. House of Representatives and the Federal Reserve Board.

Computers in Management

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Ruth

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Topics examined focused on the use of computers in applications to the development of effective management procedures in a range of agricultural, reclamation, and production processes. Specific areas included computer applications in warehouse operations, production planning of consumer products, water resources planning, agricultural operations and food processing. Discussions were also held with government officials with responsibilities for economic planning, forecasting and legislation in these areas.

At meetings at the Economic Club of Detroit and the Woodrow Wilson International Center for Scholars Dr. Lebedinskiy discussed planning processes with leading economists, government and business leaders.

During the delegation's stay in the U.S. they visited with many specialists as a group, and on occasions individual discussions were held between interested experts. A list of those who participated in the discussions from both sides are shown in attachment I.

SECTION II

The program of Cooperation for 1975 for Topic #1, "Econometric Models" and Topic #2, "Computer Analysis Applied to the Economics and Management of Large Systems" was discussed and the following agreements reached.

1. A tentative agenda of the U.S. delegation's visit to the U.S.S.R. for participating in a Transportation Conference to be held from June 30 to July 10, 1975 was furnished to the U.S. side. The present plans call for the U.S. delegation to arrive in Moscow on June 28, 1975. Papers and proceedings of this seminar will be published both in English and Russian by the corresponding sides.
2. Both sides agree that during the period June 30 to July 10, 1975 while the U.S. Coordinators are in Moscow there will be a joint meeting of Coordinators on Topic #1 and Topic #2. The following subjects will be considered and discussed.

- (A) The possible arrangement of a conference to discuss research results and the state of the art in regional economic development and analysis as applied to Alaska and Siberia. A detailed proposal will be sent to the U.S.S.R. Coordinator by the U.S. Coordinator at least two (2) weeks prior to the meeting in Moscow.

(B) Long term visits for joint efforts in selected areas. The areas which have been agreed on as appropriate are: (1) problems of modeling and planning national economies (2) methodological approaches to systems of national accounts, (3) methodological problems of dealing with uncertainty, and technological changes in planning economic systems, (4) Computer based management information systems for planning and economic management of large industrial and agriculture complexes.

(C) Both sides will present proposals for discussion of other possible seminars and visits within the scope of Topics #1 and #2.

(D) The U.S. side will outline its proposal for a U.S. visit to the U.S.S.R. on modeling and computer applications in the agriculture sector.

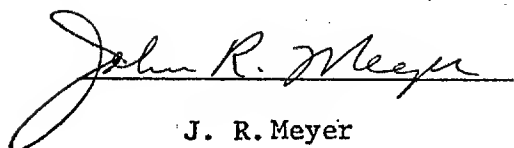
3. The U.S. side is presently developing a proposed agenda for a U.S.S.R. delegation visit on Topic #1, tentatively planned for the first two (2) weeks in August 1975. Dr. Fedorenko of CEMI will head this delegation. As soon as the agenda is complete it will be furnished to the U.S.S.R. Coordinator.

4. A three (3) day seminar on mathematical models of the U.S.-U.S.S.R. economies will be held in Moscow, September 29 to

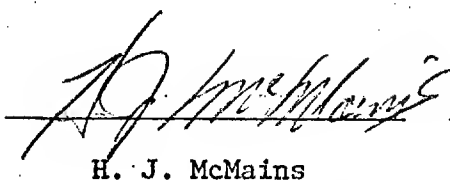
October 1, 1975. The Soviet side will be chaired by Yuri N. Ivanov - Institute of Control Problems, and the U.S. side by Robert Dorfman - Harvard University. (It is planned that the papers and proceedings of this meeting will be published in both English and Russian.)

The Protocol has been prepared in duplicate in the English and Russian languages, both equally authentic.

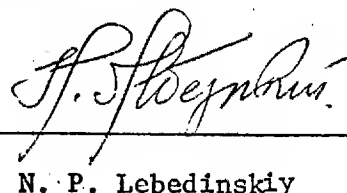
U.S. Coordinator
Topic #1


J. R. Meyer

U.S. Coordinator
Topic #2


H. J. McMains

Head of Soviet Delegation
and Soviet Coordinator
Topic #1 and #2


N. P. Lebedinskiy

May 3, 1975
Washington, D.C.

List of Participants in the Meetings in the
U.S. April 20 to May 4, 1975 - U.S.-U.S.S.R.
Working Group in the Field of the Application
Of Computers to Management

MEMBERS OF THE U.S.S.R. DELEGATION

<u>N.P. Lebedinskiy</u>	-	Deputy Chairman of GOSPLAN, and Head of Main Computing Center (head of the Delegation)
<u>N.L. Dyorets</u>	-	Chief of the Secretariat, U.S.-U.S.S.R. Joint Commission on Scientific and Technical Cooperation
<u>A.S. Popko</u>	-	Head of Sub-division, GOSPLAN
<u>V.V. Shekhovtsov</u>	-	Assistant to Deputy Chairman, GOSPLAN
<u>V.F. Soskov</u>	-	Head of Sub-division, Main Computing Center, GOSPLAN
<u>A.N. Umnov</u>	-	Deputy Administrative Manager, GOSPLAN

MEMBERS OF THE U.S. TRAVELING GROUP

C. Boldyreff	-	Interpreter - State Department
A. Malyshev	-	Interpreter - State Department
H. McMains	-	Vice President, National Bureau of Economic Research
E.K. Smith	-	Vice President, National Bureau of Economic Research

PARTICIPANTS U.S. EXPERTS AND SPECIALISTS

The Gates Rubber Company
Denver, Colorado 80217

R.G. Bonham	-	Executive Vice President, Finance & Legal
R. Rounds	-	Corporate Director, Information Services
R. Moermond	-	Manager, Computer Systems & Programming
D.R. Ahlman	-	Manager, Business Development

The Gates Rubber Company (cont.)

L. DelPiccolo	-	Manager, Business Planning & Development (International Division)
A.J. Hamano	-	Project Analyst (International Division)
R. Duncan	-	Public Relations Specialist

Gates Cyclo, Inc.
Denver, Colorado 80207

Kenneth L. Smith	-	President
------------------	---	-----------

Engineering & Research Center
U.S. Bureau of Reclamation
Denver, Colorado

W.W. Reedy	-	Chief, Division of Planning Coordination
Alan P. Kleinman	-	Head, Economics Section
Albert E. Gibbs	-	Head, Water Utilization Section
Robert B. Main	-	Computer Specialist, Water Utilization Section
Marvin Shaffer	-	Soil Chemist, Water Quality Office
Kermit K. Kober	-	Chief, Division of Water O & M
Ray Winger	-	Chief, Drainage & Groundwater Branch
Ben Prichard	-	Chief, Operations Branch
Jerry Bucheim	-	Leader, Irrigation Management Services
Darrell W. Webber	-	Chief, Division of Data Processing
Phil Enger	-	Division of General Research, Head, Instrumentation Group
R.B. Hayes	-	Head, Foreign Training & Visitor Section
Paul Capeuer	-	Chief, Power Division South Platte Project, Bureau of Reclamation
Don Neuberger	-	System Engineer, S.P.R.P.
Steven Stuntz	-	Electrical Engineer, U.S.B.R., Flatiron

Engineering & Research Center (cont.)

Elmer Graham - Estes Power Plant
Superintendent of Plant

Wendel Knickerson - Electrical Engineer, Flatiron

Farr Farms, Inc.
Greely, Colorado

W.R. Farr - President, Farr Feeders Inc.

H.R. Farr - Vice President

W. Park - Manager, Feed lot

J. Skindell - Controller

Monfort of Colorado
Greely, Colorado

Leonard Rome - Assistant Manager, Public Relations

Allard Ranch Co.
Hardin, Colorado

George Allard - President

Sesco Company, Inc.
Detroit, Michigan

Weiner Lehman - President

Carl Lehman - Vice President

The Cross Company
Fraser, Michigan

Ralph Cross - President

Richard Cotrell - Vice President, Marketing

A.J. McLaren - Group Vice President

Ford Motor Company
Detroit, Michigan

P. Caldwell - Executive Vice President, International
Operations

E. Blanch - Vice President - Finance
T.H. Mecke, Jr. - Vice President - Public Affairs
J.W. Ford - Assistant Comptroller - Economics
M. Roark - Executive Director - Systems

Burroughs Corporation
Detroit, Michigan

R.W. MacDonald - Chairman of the Board
P.S. Mirabito - President
B.L. Rouse - Vice President and Group Executive -
International Group

International Center for Scholars
Washington, D.C.

Evening dialogue: How Can Concepts of Long-Range Planning Be Made
More Effective in the United States and the
Soviet Socialist Republics

Sponsored by: Institute for Advanced Russian Studies -
Woodrow Wilson International Center for Scholars

Dr. Nikolai P. Lebedinskiy - Deputy Chairman, State Planning Committee U.S.S.R.
Dr. Jerome Jasinowski - Senior Economists, Joint Economic Committee U.S.A
Chairman James H. Billington - Director, Woodrow Wilson Center

Participants

Mark Earle, Jr. - Deputy Director, Stanford Research Institute,
Strategic Study Center
Marc Ferro - Fellow, Woodrow Wilson Center
Murray Feshbach - Demographic Division, Department of Commerce
Gary Fromm - Washington Director, National Bureau of Economic
Research
Lincoln Gordon - Fellow, Woodrow Wilson Center
Arnold Packer - Chief Economist, Senate Budget Committee
Alan A. Reich - Deputy Assistant Secretary for Educational
and Cultural Affairs, U.S. Department of State

William Root - U.S. Department of State

William G. Hyland - Director, Intelligence and Research, U.S. Department of State

Robert Rothstein - Fellow, Woodrow Wilson Center

Egon Sohmen - Fellow, Woodrow Wilson Center

John Stark - Staff Director, Joint Economic Committee

S. Frederick Starr - Director, Institute of Advanced Russian Studies, Woodrow Wilson Center

Nancy Teeters - Chief Economist, House Budget Committee

Federal Reserve Board
Washington, D.C.

Henry C. Wallich - Governor, Federal Reserve Board

Charles L. Hampton - Director, Data Processing

James Gaetzinger - Chief, Statistical Management Section

U.S. Senate
Washington, D.C.

Edmund Muskie - Chairman, Senate Committee on the Budget

Douglas Bennett - Staff Director

Arnold Packer - Chief Economist

Department of Treasury
Washington, D.C.

William Simon - Secretary

Edgar Fiedler - Assistant Secretary for Economic Affairs

Gerald Parsky - Assistant Secretary for Trade Relations

Sidney L. Jones - Counselor to the Secretary

U.S. Office of Management and Budget
Washington, D.C.

James Lynn - Director

U.S. Department of Interior
Washington, D.C.

Jack Carlson - Assistant Secretary

U.S. Department of the Census
Washington, D.C.

National Science Foundation
Washington D.C.

Don Aufenkamp - Chairman, U.S. Side of the U.S.-U.S.S.R.
Joint Working Group in the Field of the
Applications of Computers to Management

The Economic Club of Detroit (Michigan)

R.A. Swaney - President

D.P. Luther - Executive Director

Protocol

Approved For Release 2001/11/19 : CIA-RDP79-00798A000200020001-3
of the meeting in the U.S. of American Soviet
Coordinators and experts of the U.S.-U.S.S.R.
Working Group in the Field of Application of
Computers to Management (Topic 1)

SECTION I

In accordance with the agreement between the U.S. and the U.S.S.R. on Scientific and Technical Cooperation in the Field of Application of Computers to Management, signed in Moscow on November 28, 1973, and in accordance with previously agreed upon plans a meeting of coordinators and experts for Topic I, "Econometric Modeling," took place in the U.S. from September 3, 1975 to September 17, 1975.

The Soviet delegation was headed by Dr. A. A. Modin, Deputy Director of the Central Economics-Mathematical Institute of the U.S.S.R. Academy of Sciences.

The delegation visited the National Bureau of Economic Research, New York City, Cambridge, Mass., and Palo Alto, Ca.; Cowles Foundation for Research in Economics and Yale University, New Haven, Conn.; Supermarkets General Corp., Woodbridge, N.J.; Harvard University and M.I.T., Cambridge, Mass.; John Hancock Life Insurance Company, Boston, Mass.; Stanford University, Palo Alto, Ca.; RAND Corporation, Santa Monica, Ca.; University of California, Los Angeles, Ca. and discussed with U.S. experts and scholars various subjects of mutual interest.

The delegation also visited with U.S. Government officials in Washington D.C. These visits included the National Science Foundation; the U.S. Department of Commerce, Bureau of Economic Analysis and the Council of Economic Advisers of the President of the United States.

The discussions and demonstrations included Computerized Economic Models, Data Banks, International Indicators, Business Cycles, Competitive General Equilibrium Modeling, Energy and Resource Models, Data Analysis, Automatic

Computers in Management

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Supermarkets, Forest Farming, Optimal Control, Time-Varying Parameters, Water Quality Studies, Man in the Arctic Program, Capital Investment Criteria, Computers in Research, Computer Networking, Operations Research, Artificial Intelligence, Labor Markets and Supply, Social Insurance, Computer Graphics, Economic Analysis and Research in the U.S. and the General Economy.

During the delegation's stay in the U.S. they visited with many scholars and specialists in various locations in the United States. A list of those who participated in the discussions from both sides are shown in Attachment I. Attachment II is the visit agenda.

The coordinators and experts from both sides agree that the scientific and technical cooperation in the field of application of computers to management (Topic #1) is developing in accordance with the intent of the agreement of the two countries and good progress is being made.

(Topic #1, Econometric Models)

The program for further scientific and technological cooperation for the current year, 1975-76, was discussed and the following activities proposed:

(1) Both sides agreed to plan for two (2) conferences on economic and Mathematical models, one to take place in the United States in the fall of 1976, and one in the Soviet Union in the spring of 1977. The conference is to include economic studies on a national level; regional economic development models; applied migration studies; and branch industry level studies. The number of papers and conferees will be approximately six (6) from the visiting side. The proposed data and location will be determined by the host side and will notify the visiting side approximately eight (8) months prior to the proposed date. The conference program will be made available to the visiting side six (6) months prior to the conference. The papers to be available to each side about two (2) months prior to the conference. The conference visits will be for a period of approximately two (2) weeks.

(2) The Soviet side agreed to a visit of about four (4) weeks by three or four scholars from the U.S. side to review research going on in the Soviet Union on national, regional and branch modeling in the spring of 1976 so that mutual continuing cooperation in this field of research could be developed. The U.S. side invited the Soviet side to come to the U.S. for a similar visit.

(3) Consideration will be given to have two (2) conferences to discuss research results and the state of the art in regional economic development and analysis. A proposal was given to the Soviet side several months ago and during this visit they agreed to discuss the proposal with interested scientists in the Soviet Union. A meeting of Coordinators from the U.S. and Soviet sides will take place during the last of September 1975 in Moscow to decide whether these conferences will take place.

(4) The U.S. side proposed to the Soviet side that they send a scientist to the U.S. for a long-term visit for mutual interest research sometime during the current (1975-1976) year. Two sub-topics were suggested for this research:

(a) Regional or energy economic modeling at
NBER-Cambridge.

(b) Northern region studies at the
University of Alaska in Fairbanks.

The Soviet side agreed to have further discussions of this proposal with interested scientists in the Soviet Union and decide whether it is possible. The results of this effort will be discussed during the September 1975 Mathematical Modeling Conference in Moscow.

(5) The Topic #1 seminar on mathematical economic models is now finalized and will take place starting September 29, 1975. Requested visits at Soviet institutions have been arranged for the U.S. delegation by the Soviet side.

(6) Sub-topics of mutual interest under this exchange program were discussed and these are listed on Attachment #3. Proposed sub-topic chairmen are indicated on the attachment. It was further agreed that sub-

topic chairmen would be asked to prepare programs for joint cooperation in their area for review by Topic #1 Coordinators. The list will be finalized and a program of work proposed at the next coordinators' meeting.

(7) It was agreed to have two (2) Topic #1 Coordinators' meetings during the next year. One in the spring of 1976 in U.S. and one in the fall of 1976 in the U.S.S.R. It was further agreed that during these meetings particular attention would be given to developing mutual interest and programs in sub-topics #4 and #5 on attachment #3 of this Protocol.

(8) The Soviet side informed the U.S. side that Academician N. P. Fedorenko, of Central Economic-Mathematics Institute (C.E.M.I.), might visit the United States in April 1976. If he comes to the U.S. he would be willing to give several lectures on economic research and the general state of the economy in the Soviet Union. The location and time for these lectures will be mutually agreed upon by the U.S. and U.S.S.R. coordinators of Topic #1. When a date is furnished by the Soviet side for this visit, the U.S. side will furnish the coordinator of Topic #1, Dr. Modin, a proposed visit agenda and he will negotiate any necessary changes. The visit agenda will include cities and institutions to be visited.

(9) The U.S. side proposed that a U.S. scholar go to C.E.M.I. or some other institution in the Soviet Union for a long-term visit for research on one of the sub-topics under Topic #1. The U.S. side gave a proposal for a research topic to the Soviet side for their consideration. This proposal will be discussed in Moscow in September 1975 (Attachment #4).

(10) The U.S. side indicated that they would welcome a Soviet proposal for a long-term visit of U.S. scientists to research institutions in the Soviet Union. The research topics and locations are to be included in the proposal.

This Protocol has been prepared in duplicate in English and Russian languages, both equally authentic.

U.S. Coordinator
Topic #1

John R. Meyer
Dr. John R. Meyer

U.S.S.R. Coordinator
Topic #1

A. A. Modin
Dr. A. A. Modin

Attachment I

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List of Participants in the Meetings in the
U.S. September 3 to September 17, 1975 --
U.S.-U.S.S.R. Working Group in the Field of
Application of Computers to Management

MEMBERS OF THE U.S.S.R. DELEGATION

A.A. Modin	-	Deputy Director of the Central Economics-Mathematical Institute of the U.S.S.R. Academy of Sciences - Head of Delegation
V.M. Ioffe	-	Senior Scientist, Central Economics-Mathematical Institute of the U.S.S.R. Academy of Sciences
B.P. Suvorov	-	Laboratory Chief, Central Economics-Mathematical Institute of the U.S.S.R. Academy of Sciences
N.A. Kudinov	-	Deputy Chief of the Office of Administration, State Committee of the U.S.S.R. Council of Ministers on Science and Technology

MEMBERS OF THE U.S. DELEGATION

J. Meyer	-	President, National Bureau of Economic Research
H. McMains	-	Vice President, National Bureau of Economic Research
E. Smith	-	Vice President, National Bureau of Economic Research
B. Lukianoff	-	Interpreter - State Department

PARTICIPANTS U.S. EXPERTS AND SPECIALISTS

Stanford University
Stanford, California

L. Earnest	-	Lecturer, Research Computer Scientist and Associate Director, Artificial Intelligence Laboratory
E. Feigenbaum	-	Director, Heuristic Programming Project, Department of Computer Science
G. Dantzig	-	Professor of Operations Research and Computer Science

Bureau of Economic Analysis

Washington, D.C.

A. Hirsch - Chief, Econometric Studies Branch, Outlook Division

R. Bezdek - Chief, GNP by Industry Branch

A.R. Grimes, Jr. - Chief, Economic Growth Branch, Business Outlook Division

M. Feshbach - Chief, U.S.S.R./East Europe Branch, Foreign Demographic Analysis Division

John Hancock Life Insurance Company

Boston, Massachusetts

S. Davis - Director - General Marketing

Harvard Business School
Cambridge, Massachusetts

J. McKenney - Professor of Business Administration

J. Lintner - George Gund Professor of Economics and Business Administration

Massachusetts Institute of Technology

Cambridge, Massachusetts

M. Weitzman - Professor of Economics

National Bureau of Economic Research

New York, New York

C. Boschan - Senior Research Staff, Director of Data Processing

J. Su - Senior Research Analyst and Manager of NBER Time Series Data Bank

G. Moore - Vice President - Research

E.K. Smith - Vice President

V. Zarnowitz - Professor of Economics, University of Chicago
Senior Research Staff, National Bureau of Economic Research

Cambridge, Massachusetts

R. Leone - Research Associate

E. Kuh - Co-Director of the Computer Research Center

Cambridge, Massachusetts (Cont'd)

D. Kresge - Research Associate
 J.R. Ginn - Senior Research Staff
 K. Wall - Research Associate
 T. Cooley - Research Associate

Supermarkets General Corporation
Woodbridge, N.J.

R.E. Wunderle - Economist and Vice President, Public Affairs
 C. M. Yee - Manager, Point of Sale Projects
 M. Perlmutter - President, Pathmark Stores

Yale University
New Haven, Connecticut

S. Dresch - Professor of the Institution for Social and Policy Studies
 Research Associate, National Bureau of Economic Research
 E. Hunushek - Assistant Professor of Institution for Social and Policy Studies and Economics
 R. Nelson - Professor of Economics and Institution for Social and Policy Studies

Cowles Foundation for Research in Economics
Yale University, New Haven, Connecticut

H. Scarf - Stanley R. Resor Professor of Economics
 T. Koopmans - Alfred Cowles Professor of Economics
 W. Nordhaus - Professor of Economics

Council of Economic Advisers
Washington, D.C.

P. MacAvoy - Member of the President's Council of Economic Advisers

University of California
Los Angeles, California

C.M. Newton - Professor and Chairman, Department of Biomathematics, School of Medicine

V. Fuchs	-	Vice President
S. Maisel	-	Vice President and Co-Director
R. Willis	-	Senior Research Staff
R. Michael	-	Senior Research Staff, Assistant Vice President

National Science Foundation
 Washington, D.C.

D.D. Aufenkamp	-	Chairman, U.S. Side of the U.S.-U.S.S.R. Joint Working Group in the Field of Applications of Computers to Management
J. Blackman	-	Program Director for Economic Research

Rand Corporation
 Santa Monica, California

F. Welch	-	Director of Labor and Population Studies Program
J. McCall	-	Research Consultant on Manpower Personnel and Health
C. Morris	-	Research on the Statistical Design of the Health Insurance Study
J.P. Newhouse	-	Principal Investigator and Project Director - Health Insurance Study
C.E. Phelps	-	Research Economist
B. Mitchell	-	Research Consultant, Economics Department
J.E. Rolph	-	Research in the Health Insurance Study
J. Cogan	-	Research Consultant
G. Hanoch	-	Consultant